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Materials for a Flora of the Malayan Peninsula.—By SIR GEORGE KING, K.C.I.E., LL.D., F.R.S., late Superintendent of the Royal Botanic Garden, Calcutta, and J. SYKES GAMBLE, C.I.E., F.R.S., late of the Indian Forest Department.

No. 21.

THIS Part contains two Families, No. 86 *Gesneraceæ* and No. 90 *Verbenaceæ*, and completes the account of the Gamopetalæ. The account of the *Gesneraceæ* was prepared by Mr. H. N. Ridley, F.R.S., Director of the Botanic Garden at Singapore, and was published in the 'Journal of the Straits Branch of the Royal Asiatic Society for 1905.' The material used by him was that of the Herbaria of Singapore and Penang, together with that belonging to the Royal Botanic Garden of Calcutta, and chiefly got together by collectors employed by Sir George King, lent to Mr. Ridley for the purpose. The account in the 'Straits Journal' not being quite in the form used in the 'Materials,' published under the auspices of the Asiatic Society of Bengal, has been edited by Mr. Gamble, with the kind help of Lt.-Col. Prain, of Kew, but he has been careful to make no more formal alterations than could be helped; so that the work is one for which Mr. Ridley alone is responsible. Only numbers personally verified or quoted by Mr. Ridley have been entered under the different species. Mr. Ridley, who has sanctioned what has been done, has himself furnished a few notes and additions, among them being descriptions of 3 new species, one of them the representative of a new genus. The number of species of *Gesneraceæ* herein described is 131, belonging to 20 genera, 1 genus and 2 species being new, besides 1 Sumatran species newly described.

The *Verbenaceæ* have been done by Mr. Gamble. It comprises 15 genera and 72 species, of which 16 species are new to science. Two Malay Islands species are also described.

In accordance with the Rules adopted at the Vienna Conference, Latin diagnoses are appended to the new genus and the 3 new species of *Gesneraceæ*, those for *Verbenaceæ* have been published in the Kew Bulletin.

Family LXXXVI.—GESNERACEÆ.

Herbs or shrubs, usually pubescent. *Leaves* opposite or apparently alternate, one of each pair being much reduced, simple entire or lobed. *Inflorescence* axillary, cymose or racemose or paniced; bracts small or large. *Calyx* of 5 sepals, often connate. *Corolla* tubular or campanulate, more or less distinctly bilabiate, 5-lobed; lobes oblong or rounded. *Stamens* 4 or 2, rudimentary or absent, didynamous when four; filaments linear or filiform, or short and thick; anthers linear or oblong, or scutiform, connivent in pairs, 2-celled; cells splitting on the inner face. *Disk* cylindric or annular or absent. *Ovary* cylindric or oblong; style slender, simple; stigma capitate, cordate or bilobed. *Fruit* a capsule, linear, cylindric, fusiform or oblong, splitting dorsally. *Seeds* very numerous, minute, plumed in epiphytic species, elliptic and not plumed in terrestrial species; or a fleshy berry (*Cyrtandra*).—DISTRIB. Species about 600, all tropical with a few in subtropical climates.

Seeds with one or more hairs from near hilum, and a single hair from apex; fruit dehiscent, a cylindric capsule:—

Stamens 4 perfect	..	..	..	..	1. ÆSCHYANTHUS.
Stamens 2 perfect	..	..	..	..	2. AGALMYLA.

Seeds without hairs:—

Fruit dehiscent, a capsule, follicle or pyxidium:—

Capsules or follicles cylindric or rarely (*Loxocarpus*) conic:—

Corolla funnel-shaped:—

Stamens 4	3. DIDISSANDRA.
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Stamens 2:—

Capsule linear.

Stigma entire, ovate or capitate	4. DIDYMOCARPUS.
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Stigma 2-fid	5. CHIRITA.
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Capsule lanceolate or ovate	6. TETRAPHYLLUM.
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Corolla shortly campanulate:—

Stamens 2:—

Fruit a conic follicle	7. LOXOCARPUS.
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Fruit a cylindric capsule:—

Capsule straight	8. PARABOEA.
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Capsule twisted:—

Calyx 5-lobed	9. BOEA.
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Calyx 3-lobed	10. PHYLLOBOEA.
Stamens 4	11. BOEICA.
Capsules or pyxidial ovoid or ellipsoid :—	
Stamens 2 :—	
Sepals free to the base :—	
Stem very short; calyx-lobes linear	12. ORCHADOCARPA.
Stem elongate; calyx-lobes ovate	13. LEPADANTHUS.
Sepals connate half-way up in a campanulate calyx	14. RHYNCOGLOSSUM.
Stamens 4 :—	
Fruit with dehiscence circumscissile	15. EPITHEMA.
Fruit splitting irregularly :—	
Herbs :—	
Leaf solitary; flowers minute	16. MONOPHYLLAEA.
Leaves several alternate; flowers large	17. STAURANTHERA.
Shrubs leafy :—	
Sepals free to the base; flowers small	18. RHYNCHOTECHUM.
Sepals connate in a tubular shortly lobed calyx; flowers large	19. CYRTANDROMOEA.
Fruit indehiscent, baccate; stamens 2	20. CYRTANDRA.

1. ÆSCHYNANTHUS, Jack.

Epiphytes or rock-plants, with slender creeping or erect half-woody stems. *Leaves* opposite or whorled, fleshy or coriaceous, entire, ovate or lanceolate. *Flowers* large, usually showy, red yellow or green, in axillary or terminal heads, pedicelled. *Bracts* ovate or lanceolate, small. *Calyx* tubular or campanulate, subentire or more or less lobed, or sepals free to the base. *Corolla* tubular, curved, dilated above, shortly 2-lipped; upper lip of 2 lobes erect; lower of 3 lobes deflexed. *Stamens* 4 perfect, didynamous, usually exsert; anthers connivent in pairs; loculi oblong, parallel. *Ovary* superior, with a short cup-shaped disk at the base; style as long as stamens or shorter; stigma dilate or peltate. *Capsule* long-cylindric; base usually empty and narrower (gynophore), 2-valved loculicidally. *Seeds* innumerable, minute, oblong, rugose, with one or more hyaline scabrid hairs from near the hilum, and one from the apex.—DISTRIB. Species about 64, in India, Malaya and Hongkong; chiefly Malayan.

Seeds with a plume of hairs at one end, a single hair at the other (§ POLYTRICHUM); sepals free or very nearly so :—

- Leaves pink beneath 1. *Æ. Motleyi.*
- Leaves green, with transverse purple bars beneath 2. *Æ. marmorata.*

Seeds with a single hair at each end (§ HAPLOTTRICHUM) :—

- Sepals free or very nearly so :—
- Leaves in whorls of 4 or 5 3. *Æ. speciosa.*
- Leaves crowded towards the ends of the stems, opposite;
sepals glabrous 4. *Æ. stenophylla.*
- Leaves opposite in pairs :—

Corolla-tube 2-3 in. long:—			
Sepals pubescent	..	..	.. 5. <i>Æ. longiflora.</i>
Sepals glabrous	..	..	.. 6. <i>Æ. perakensis.</i>
Corolla-tube under 1 in. long	..	..	.. 7. <i>Æ. Hildebrandii.</i>
Sepals distinctly connate below:—			
Calyx tubular, its mouth distinctly 5-lobed:—			
Stems erect or pendent, not rooting at the nodes:—			
Calyx 1 in. long, lobes under .5 in. long	..	..	.. 8. <i>Æ. rhododendron.</i>
Calyx 1.25 in. long, lobes .5 in. long	..	..	.. 9. <i>Æ. longicalyx.</i>
Stems creeping, rooting at the nodes:—			
Leaves glabrous	..	..	.. 10. <i>Æ. Lobbiana.</i>
Leaves pubescent	..	..	.. 11. <i>Æ. radicans.</i>
Calyx cupular or campanulate, mouth entire or sub-entire:—			
Calyx green, cupular	..	..	.. 12. <i>Æ. Wallichii.</i>
Calyx red, widely obconic	..	..	.. 13. <i>Æ. obconica.</i>

1. *ÆSCHYNANTHUS MOTLEYI*, Clarke in DC. Monog. Phan. V. i. 20 (1883). Epiphytic woody plant; branches erect or pendulous, about 12 to 18 in. long. *Leaves* opposite, fleshy; lanceolate or ovate-lanceolate, acute; margins undulate or not; upper surface light green, lower pink; 3 to 4 in. long, .5 to 1.5 in. broad; petiole .25 in. long. *Flowers* solitary or few, axillary, pendulous; pedicels .25 in. long or less. *Calyx*-tube short, .125 in. long; lobes .75 to 1 in. long, glabrous, blackish-red. *Corolla*-tube .75 to 1.25 in. long, dilated upwards and at the base, light green; lobes rounded, sparingly hairy, the tips of the petals dark purple-brown. *Stamens* brown; filaments glabrous. *Ovary* oblong, with 5 glandular patches at base; style very short, cylindric; stigma capitate. *Capsule* cylindric, narrowed at the tip, 9 to 13 in. long. *Seed* .06 in. long, oblong, blunt, pustular; plume .5 in. long. Ridley in Journ. Linn. Soc. XXXII. 500, and in Journ. Str. Br. R. As. Soc. No. 43, 12.

PERAK: Larút Hills, Kurau and Batang Padang, Wray 245, 1475; *Scortechini*; Goping, Kinta, *King's Collector* 4463. PAHANG: Pulau Manis, Pahang River, *Ridley* 2151. JOHORE: Batu Pahat, *Ridley*. SINGAPORE: Chanchu Kang, *Ridley* 6244.—DISTRIB. Sumatra, Borneo, Celebes, Ceram.

2. *ÆSCHYNANTHUS MARMORATA*, T. Moore in Paxt. Fl. Gard. III. 56 (1852-53). An epiphyte, with erect woody stems about 12 in. high. *Leaves* fleshy, lanceolate, acute, narrowed at the base; light green on the upper surface with lighter variegations, dull green with transverse purple bars on the lower; petiole .25 in. long. *Flowers* solitary or few together, axillary; pedicels slender, .25 in. long. *Calyx*-tube very short (hardly any); lobes linear, pubescent, .35 to .4 in. long. *Corolla*-

tube a little over 1 in. long, dilated upwards, curved; lobes rounded, pubescent, green with brown bars in the mouth. *Stamens* 1·5 in. long; filaments hairy. *Style* hairy; stigma bilobed. *Capsule* 6 in. long, rather thick. *Seed* oblong, pustular; plume ·5 in. long. N. E. Brown in Gard. Chron. XVIII. 787 (1882); Clarke in DC. Monog. Phan. V. i. 38; Ridley in Journ. Linn. Soc. XXXII. 500, and in Journ. Str. Br. R. As. Soc. No. 43, 13. *Æ. zebrina*, Van Houtte Cat. (1851).

KEDAH: at Gunong Raya, Langkawi Islands, *Curtis* 2142. PENANG: Government Hill, *Curtis* 1700; *Ridley*.—DISTRIB. Burma (Mergui), Siam.

3. *ÆSCHYNANTHUS SPECIOSA*, Hook. Bot. Mag. t. 4320 (1847). A shrubby plant, with erect rather stout stems about 1 ft. high. *Leaves* fleshy, in whorls of 4 to 5, lanceolate, acute; margins smooth or undulate; 3 to 6 in. long, ·75 to 1·75 in. broad; petiole ·125 to ·25 in. long. *Flowers* large, showy, subterminal, clustered 10 or more together; bracts linear-lanceolate, hairy, ·25 in. long; pedicels slender, ·5 in. long. *Calyx*-lobes linear, free to the base, pubescent, ·5 in. long. *Corolla*-tube 3 in. long, narrow-cylindric at base, enlarged and curved above; lobes rounded, all pubescent. *Stamens* ·5 in. long, longer than the corolla-tube; filaments slender, slightly pubescent. *Style* stout, pubescent. Paxt. Mag. XIV. 199; Fl. des Serres Ser. I. t. 267; Miq. Fl. Ind. Bat. II. 718; Clarke in DC. Monog. Phan. V. i. 33; Ridley in Journ. Linn. Soc. XXXII. 499, and in Journ. Str. Br. R. As. Soc. No. 43, 14.

PERAK: Bruseh, near Bidor, *W. G. Napier*. SELANGOR: Bukit Hitam, *Kelsall*; Tomoh, *Machado*.—DISTRIB. Java, Sumatra (*Forbes* 2526), Borneo.

4. *ÆSCHYNANTHUS STENOPHYLLA*, Ridley, n. sp. *Stem* slender, 1 to 2 ft. long; internodes ·5 in. long. *Leaves* fleshy, glabrous, crowded towards the top of the stems; linear lanceolate, subacute, slightly narrowed at base; 2 in. long, ·25 in. broad. *Flowers* solitary in the axils of the leaves; pedicels very short, angular, glabrous, ·25 in. long. *Calyx*-lobes linear, acute, glabrous, ·125 in. long. *Corolla* (only one bud seen) small, pubescent. *Capsule* papery, linear, cylindric, 1 ft. long. *Disk* annular. *Seeds* with a single long white hair ·75 in. long.

PERAK: at Goping Kinta, at 500 to 800 ft. elevation, found growing on the hollow branch of a large tree, *King's Collector* 4738.—DISTRIB. Sumatra? (*Forbes* 2535).

[*ÆSCHYNANTHUS STENOPHYLLA*, Ridley, n. sp. *Caulis* gracilis, 30 ad 60 cm. longus, 1 ad 1·5 cm. intra nodos. *Folia* carnosa, glabra, versus apicem caulis congesta; lineari-lanceolata, subacuta, ad basin attenuata; 5 cm. longa, 6 mm. lata. *Flores* in axillis foliorum solitarii; pedicelli brevissimi, angulares, glabri, 6 mm. longi. *Calycis* lobi lineares, acuti, glabri, 3 mm. longi. *Corolla* parva, pubescens. *Capsula* chartacea,

linearis, cylindrica, 30 cm. longa; discus annularis. *Semina* pilo unico albo 2 cm. longo munita.

PENINSULA MALAYANA in Prov. Perak, circa 1500 ad 2500 m. alt.]

5. *ÆSCHYNANTHUS LONGIFLORA*, DC. Prodr. IX. 262 (1845). An erect woody plant, with stem over 1 ft. high. *Leaves* opposite, in distant pairs, fleshy; ovate, acuminate, shortly narrowed at base; 5 in. long by 2 in. wide; petiole .5 in. long. *Flowers* several, terminal, in a cluster; pedicels hairy, .5 in. long. *Calyx*-lobes narrowly linear, .5 in. long, puberulous, free nearly to the base. *Corolla*-tube scarlet, 3 in. long, cylindric at base, dilated above, hairy; lobes short, rounded. *Stamens* .75 in. longer than corolla-tube; filaments slender, pubescent. *Style* rather stout. *Capsule* cylindric, narrow, over 6 in. long. Hassk. Cat. Hort. Bogor. ed. 2, 154; Hook. Bot. Mag. t. 4328; De Vriese Pl. Ind. Bat. Reinw. 9; Fl. des Serres Ser. 1, t. 288; Paxt. Mag. XV. 25; Miq. Fl. Ind. Bat. II. 717; Clarke in DC. Monog. Phan. V. i. 32; Ridley in Journ. Linn. Soc. XXXII. 499, and in Journ. Str. Br. R. As. Soc. No. 43, 14. *Lysionotus longiflora*, Bl. Bijdr. 766.

PAHANG: on trees along the Tahan River, *Ridley* 2167.—DISTRIB. Java.

6. *ÆSCHYNANTHUS PERAKENSIS*, *Ridley* in Journ. Linn. Soc. XXXII. 449 (1895). A shrubby epiphyte, with stems about 2 ft. long. *Leaves* coriaceous; lanceolate, acuminate; 3 to 7 in. long, 1 to 2 in. wide; nerves inconspicuous. *Flowers* in a terminal fascicle, on pedicels nearly .5 in. long; bracts subulate, .125 in. long. *Calyx*-lobes linear, .25 in. long, glabrous, free to the base. *Corolla*-tube deep red, 2 to 2.5 in. long, narrow at the base, dilated and curved upwards, nearly glabrous; lobes rounded. *Stamens* .75 in. longer than corolla-tube; filaments glabrous or sparingly pubescent. *Capsule* more than 1 ft. long. *Seed* narrowly oblong, pustular, with a single hair at each end. *Ridley* in Journ. Str. Br. R. As. Soc. No. 43, 15.

PERAK: in Larut Hills at 5500 ft., *Ridley*; *Curtis* 11447; *King's Collector* 2337, 7022; at Sungei Ryah, *King's Collector* 3641; at Thaiping, *King's Collector* 8314.

7. *ÆSCHYNANTHUS HILDEBRANDII*, *Hemsl.* in Bot. Mag. t. 7365 (1894). A shrubby epiphyte; branches about 6 in. long, often rooting. *Leaves* fleshy, in distant pairs, glabrous, sessile; ovate, acute, base rounded; margins ciliate and with distant glands .5 in. long and broad. *Flowers* few, terminal at the ends of the branches; pedicels .25 in. long. *Calyx*-lobes free to the base, linear, acuminate, pubescent, .15 to .2 in. long. *Corolla*-tube thick, curved, little dilated, .75 in. long, glabrous, orange in colour; lobes short, red, rounded, pubescent. *Stamens* shortly exsert,

hairy. *Capsule* 6 in. long; base narrowed, sterile. Ridley in Journ. Linn. Soc. XXXII. 502, and Journ. Str. Br. R. As. Soc. No. 43, 15.

PERAK: Larút Hills, at 4500 ft., *Ridley*; at Gunong Ijuk, *Scortechini* 1187. PAHANG: Kluang Terbang and Gunong Benom, *Barnes*.—
DISTRIB. Burma.

8. *ÆSCHYNANTHUS RHODODENDRON*, Ridley in Journ. Linn. Soc. XXXII. 500 (1895). An erect epiphytic shrub, 1 to 2 ft. high; stems stout, woody. *Leaves* opposite, in distant pairs, fleshy-coriaceous; ovate, acuminate; 2 in. long, 1.5 in. wide; nerves inconspicuous; keel prominent. *Flowers* several together, axillary and terminal; pedicels about .5 in. long. *Calyx* tubular, deep purple, 1 in. long; lobes short, acute, glabrous. *Corolla* 3 in. long; tube thick, dilated above, glabrous; lobes oblong, rounded, .5 in. long, pubescent, deep red with 3 black streaks on the lower lobes. *Stamens* very shortly exsert, little longer than the corolla, pubescent. *Capsule* cylindric, rather stout, 4 in. long; base narrowed into a gynophore. *Seeds* with a single hair at each end, brown, scabrid. Ridley in Journ. Str. Br. R. As. Soc. No. 43, 15.

PERAK: Larút Hills at 2500 to 6000 ft. elevation, *Ridley*; *Curtis* 1311; *Scortechini* 58, 388; Plus River, *Scortechini* 468; *King's Collector* 2332.

9. *ÆSCHYNANTHUS LONGICALYX*, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 16 (1905). *Stems* woody, over 1 ft. long. *Leaves* thick, fleshy, glabrous; ovate, acuminate; 2 to 3 in. long, 1 to 1.5 in. broad; midrib prominent; nerves obscure. *Flowers* large, terminal; pedicels .5 in. long. *Calyx* elongate, tubular, glabrous, red, 1.25 in. long, with 5 long thin lanceolate acute lobes .5 in. long. *Corolla* red with dark blotches in the mouth, 3 in. long, glabrous without; mouth pubescent; lobes rounded. *Stamens* nearly as long as corolla, pubescent. *Style* stout, pubescent; stigma capitate.

PERAK: *Scortechini* 36; at Gunong Batu Putih, *Wray* 1636. SELANGOR: Semangko Pass, *A. M. Burn-Murdoch*.

10. *ÆSCHYNANTHUS LOBBIANA*, Hook. Bot. Mag. t. 4260 (1846). A climbing epiphyte, with slender stems rooting along tree-trunks. *Leaves* in pairs, coriaceous, lanceolate or ovate-lanceolate, glabrous; 1.5 to 2 in. long, .25 to .75 in. broad; petioles short. *Flowers* in axillary and terminal fascicles 3 to 5 together; pedicels slender, .75 in. long or less. *Calyx* tubular, 1 in. long, dark purple, thickly pubescent; lobes very short. *Corolla*-tube 2 in. long, thick, curved; lobes deep red, thickly pubescent, broad, rounded. *Stamens* barely exserted. *Capsule* 13 in. long, cylindric on a gynophore. *Seed* very small, oblong, pustular, with a hyaline mass at the hilum, and a single long white hair at each end. Fl. des Serres Ser. 1, t. 246; Miq. Fl. Ind. Bat. II. 721; Clarke in

Hook. f. Fl. Br. Ind. IV. 343, and in DC. Monog. Phan. V. i. 44; Ridley in Journ. Str. Br. R. As. Soc. No. 43, 16.

KEDAH: at Gunong Jerai, *Ridley* 5513; at Gunong Raya, Langkawi, *Curtis* 2503. PENANG: on Government Hill, *Curtis*. PERAK: in Larút Hills to 5000 ft. alt., *Curtis*; *Wray* 873; *Scortechini* 36, 39, 330, 352. PAHANG: at Pekan, *Ridley*; at Kuautan, *Durnford*. SELANGOR: on Pahang track, *Ridley*. MALACCA: *Maingay* (K.D.) 1218, 1219; Mount Ophir and Ayer Panas, *Ridley* 1572. JOHORE: at Batu Pahat, *Ridley*; at Gunong Pulai, *G. King*; at Jambu Larang, *Fielding*. SINGAPORE: at Sungei Tengeh, *Ridley* 2710, at Kranji, *Ridley* 2706.—DISTRIB. Java, Sumatra, Borneo.

King's Collector No. 2636, from Larút, Perak, is a specimen with very fleshy leaves, but cannot yet be separated from *A. Lobbiana*, as there are in the series intermediates between it and the thin-leaved forms. It seems to occur only at high elevations.

11. *ÆSCHYNANTHUS RADICANS*, Jack in Trans. Linn. Soc. XIV. 43 (1823). An epiphytic plant growing on trees or rocks, the hairy stems creeping and rooting at the nodes, several feet long. *Leaves* hairy, shortly petioled; ovate, obtuse, broad at base; .5 to 1.25 in. long, .5 to .75 in. wide. *Flowers* axillary, 1 to 2 together; pedicels .5 in. long. *Calyx* tubular, hairy, deep red; lobes obtuse or subacute, .75 in. long. *Corolla* red, thick, curved, hairy; lobes subacute, glabrescent within. *Stamens* hardly exsert; filaments glabrous. *Capsule* cylindric, pubescent, acuminate, slender, 10 in. long. Calc. Journ. Nat. Hist. IV. 62; Spreng. Syst. II. 838; R. Br. in Benn. Pl. Jav. Rar. 115, and in Ann. Sc. Nat. 2, Vol. XIII. 160; DC. Prodr. IX. 202; De Vriese Pl. Ind. Bat. Reinw. 10; Miq. Fl. Ind. Bat. II. 720; Clarke in Hook. f. Fl. Br. Ind. IV. 343, and in DC. Monog. Phan. V. i. 41; Ridley in Journ. Linn. Soc. XXXII. 501, and in Journ. Str. Br. R. As. Soc. No. 43, 17. *Trichosporum radicans*, Nees in Flora (1825), 144; Blume Bijdr. 764.

PERAK: Bujong Malacca, *Ridley*; Sungei Rayah, *Scortechini* 37. TRINGGANU: Bundi, *Rostado*. MALACCA: *Griffith* (K.D.); *Cuming* 2387; Sungei Rambai, *Derry* 205; Sungei Ujong, *Cantley*.—DISTRIB. Sumatra, Java, Borneo.

VAR. *lanuginosa*, Ridley. *Calyx* green, densely white woolly, as is the outside of the corolla-tube.

PERAK: *Scortechini* 330.

12. *ÆSCHYNANTHUS WALLICHII*, R. Br. in Benn. Pl. Jav. Rar. 116 (1840). *Stems* rather slender, woody, glabrous. *Leaves* glabrous; lanceolate or elliptic, acuminate, narrowed at the base into the petiole; 3 in. long, 1 to 1.25 in. wide; petiole .25 in. long. *Flowers* few together,

subterminal; pedicel .25 in. long, slender. *Calyx* small, cupshaped, green, .25 in. long, hairy, almost entire. *Corolla* dark red, .75 in. long; tube stout; lobes rather large, rounded, hairy. *Stamens* included; filaments glabrous. *Capsule* 8 in. long, narrow, terete. Ann. Sc. Nat. 2. XIII. 160; Clarke in Hook. f. Fl. Br. Ind. IV. 343, and in DC. Monog. Phan. V. i. 48; Ridley in Journ. Linn. Soc. XXXII. 502, and in Journ. Str. Br. R. As. Soc. No. 43, 18. *A. radicans*, Wall. Cat. 798A (*non* Jack).

PERAK: Bujong Malacca, *Curtis*; Tapa, *Wray* 1417. MALACCA: Mount Ophir, *Lobb*, *Maingay* (K.D.) 1219. JOHORE: Tanjong Kopang, *Ridley*; Ulu Batu Pahat, *Kelsall*. SINGAPORE: *Wallich* 798A; Bukit Mandal, Chanchu Kang, Kranji, *Ridley*.—DISTRIB. Sumatra, Borneo.

13. *ÆSCHYNANTHUS OBCONICA*, Clarke in DC. Monog. Phan. V. i. 50 (1883). *Stems* about a foot long or more, woody, glabrous. *Leaves* in pairs, coriaceous, glabrous; elliptic oblong or ovate, acuminate, narrowed at base into the petiole; 1.5 to 3 in. long, .75 to 1.25 in. broad; petiole .25 in. long. *Flowers* subterminal, a few in a cluster; pedicels .25 in. long, hairy. *Calyx* deep red, obconic, wide, hairy, .25 in. long; mouth entire. *Corolla* .5 in. long; tube thick and short; lobes rounded, hairy, deep red with yellowish-white central bars. *Stamens* very shortly exsert; filaments nearly glabrous. *Capsule* 8 in. long, cylindric. Clarke in Hook. f. Fl. Br. Ind. IV. 343; Bot. Mag. t. 7336; Ridley in Journ. Linn. Soc. XXXII. 501, and in Journ. Str. Br. R. As. Soc. No. 43, 18.

PERAK: Batu Kuran and Bujong Malacca, *Curtis* 2990, 3335; Larút Hills, *Ridley* 2905; Blanja and Relan Tujor, *Wray* 149, 1772; *Scortechini* 28, 1861; Larút Peak at 2000 to 3000 ft., *King's Collector* 2012, 2849, 10179. DINDINGS: Pangkore, *Curtis* 1338. SELANGOR: Klang, *Beccari*.—DISTRIB. Borneo (*Motley* 687 fide *Hook. f.*).

The following Sumatran species is herein described.

ÆSCHYNANTHUS FORBESII, *Ridley*, nov. sp. An epiphytic shrub; *stems* creeping; branches slender, about a foot long. *Leaves* opposite, fleshy; ovate-lanceolate, acute; 2 to 2.5 in. long, .5 in. broad; midrib elevated, other nerves inconspicuous; petiole .2 in. long. *Flowers* subsolitary, axillary; pedicels .2 in. long. *Calyx*-lobes free to the base, extremely short, linear or acuminate, tips setiform, .2 in. long. *Corolla*-tube nearly .75 in. long, slightly curved and dilated upwards, pubescent, scarlet. *Style* hairy.

SUMATRA: Mount Dempo, 5700 ft., *Forbes* 2268. Rather remarkable for its very small calyx lobes.

[*ÆSCHYNANTHUS FORBESII*, *Ridley*, nov. sp. Frutex epiphyticus; caules reptantes, ramis 30 cm. longis gracilibus. *Folia* opposita, carnosa, ovato-lanceolata, acuta; 5-6 cm. longa, 10-15 mm. lata; præter costam elevatam nervis inconspicuis; petioli 5 mm. longi. Flores subsolitarii axillares; pedicelli 5 mm. longi. *Calycis* lobi ad basin liberi, brevissimi, lineares vel acuminati, 5 mm. longi, apicibus setiformibus. *Corollæ* tubus

ad 2 em. longus, paullo curvatus et sursum dilatatus, pubescens, coccineus. *Stylus* pubescens.

SUMATRA : ad Montem Dempo 1700–1800 m. alt. calycis lobis minimis distincta.]

2. AGALMYLA, Blume.

Climbing epiphytic shrubs, with loose bark. *Leaves* alternate, long petioled, herbaceous, lanceolate or ovate-lanceolate. *Flowers* showy, scarlet, in compact axillary cymes. *Calyx* deeply 5-cleft; lobes narrow, acute. *Corolla* tubular, ventricose above, 2-lipped; lobes 5, ovate, obtuse. *Stamens* 2 perfect, long exsert; filaments slender; anthers connivent, imperfect; staminodes 2 to 3. *Disk* annular, thick. *Ovary* superior, linear, glabrous; style as long as or longer than the stamens; stigma 2-lipped. *Capsule* linear, long, 2-valved loculicidally. *Seeds* small, oblong, with a single hair at each end.—DISTRIB. Species 3, in the Malay Peninsula and Archipelago.

1. AGALMYLA STAMINEA, Blume Bijdr. 767 (1826). *Stems* very long, twining, hairy, at length glabrous. *Leaves* light green; elliptic-oblong, acuminate at both ends; lower surface strigose; 8 to 12 in. long, 3 to 4 in. broad; main nerves 8 to 10 pair; petiole 6 to 8 in. long, hairy. *Cymes* subsessile; bracts lanceolate; pedicels strigose. *Calyx* 5 in. long; lobes lanceolate, acute, pubescent, free nearly to base. *Corolla* 1 in. long, curved, dilated, scarlet, pubescent; lobes short, rounded. *Stamens* exsert for 1 in., glabrous; anthers oblong. *Style* stout, often very short, glabrous. *Capsule* 14 in. long, slender. R. Br. in Benn. Pl. Jav. Rar. 116, and in Ann. Sc. Nat. 2, XIII. 161; DC. Prodr. IX. 263; Hook. Ic. Pl. t. 733; De Vriese Pl. Ind. Bat. Reinw. 10; Hook. Bot. Mag. t. 5747; Fl. des Serres Ser. 1, t. 358; Miq. Fl. Ind. Bat. II. 722; Clarke in DC. Monog. Phan. V. i. 56; Ridley in Journ. Linn. Soc. XXXII. 502, and in Journ. Str. Br. R. As. Soc. No. 43, 19. *Justicia parasitica*, Lam. Ill. I. 42 (non Vahl). *Cyrtandra staminea*, Vahl Enum. I. 105.

PERAK: Larut Hills, Curtis 2042, and Ridley 2916; Maxwell's Hill, 3000 ft., Fox and Scortechini 295; Wray 2800; at 1000 to 3500 ft. King's Collector 2053, 2349, 2396, 6970.—DISTRIB. Java, Sumatra (Forbes 1864, 1948).

3. DIDISSANDRA, Clarke.

Shrublets or herbs, with short or tall stems, hairy. *Leaves* opposite, in remote pairs or crowded at the tip. *Flowers* solitary on subterminal peduncles or several on short axillary peduncles; bracts small, usually arrow. *Calyx*-lobes 5, free to the base or nearly so, lanceolate or ovate. *Corolla* blue, white, pink or yellow, narrowly tubular, dilated upwards,

occasionally broadly tubular, infundibuliform; limb bilobed, usually unequally; lobes rounded. *Stamens* 4 perfect, in two pairs; filaments long, slender; anthers ovate or elliptic adhering by their faces; cells parallel, connective sometimes prolonged into a horn. *Disk* annular, small. *Ovary* cylindric, sessile; style as long or longer; stigma broad, ovate. *Capsule* cylindric, linear elongate, rarely short and thick, sessile, splitting along the upper edge, not twisted.—*DISTRIB.* Species about 20, in India, in the Malay Peninsula and Sumatra.

Stems tall; nodes distant; flowers several together in axillary clusters; leaves hairy above:—

- Leaf-margins entire 1. *D. johorica*.
- Leaf-margins minutely crenulate 2. *D. frutescens*.

Stems short; leaves crowded at apex; flowers 1, rarely 2 or more, on subterminal peduncles:—

Leaves hairy above, their margins serrate or dentate:—

Capsule slender, cylindric:—

Sepals lanceolate acuminate, .25 in. long:—

- Leaves simply serrate 3. *D. hirta*.
- Leaves doubly serrate 4. *D. serratifolia*.
- Sepals oblong-ovate, .125 in. long .. 5. *D. atrocyanea*.

Capsule short, thick, fusiform 6. *D. latisejala*.

Leaves glabrous above:—

Leaf-margins entire, sinuate or obscurely crenulate:—

Flowers orange 7. *D. flammea*.

Flowers violet-purple:—

Corolla-tube slender, infundibuliform .. 8. *D. violacea*.

Corolla-tube wide, cylindric 9. *D. atropurpurea*.

Leaf-margins serrate, or dentate, or lobed:—

Sepals glabrous:—

Leaves simply dentate; corolla white with violet markings, pubescent 10. *D. Wrayi*.

Leaves runcinate; corolla lemon-yellow, glabrous 11. *D. quercifolia*.

Sepals more or less pubescent:—

Leaves coarsely serrate; sepals linear lanceolate .. 12. *D. glabrescens*.

Leaves deeply lobed; sepals elliptic 13. *D. filicina*.

1. *DIDISSANDRA JOHORICA*, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 22 (1905). Shrubby, 2 to 3 ft. high; stems pustular below, hairy above. *Leaves* alternate below, opposite above; lanceolate, acuminate, long-cuneate at base; margins entire; upper surface sprinkled with short conic hairs, lower shortly scabrid-hairy; 6 in. long, 1.25 in. broad; main nerves 6 to 7 pairs, ascending. *Cymes* axillary; peduncles slender, hairy, 1 in. long; bracts short, linear lanceolate; flowers 3 to 4 to each peduncle. *Calyx*-lobes small, linear lanceolate, acute, hairy.

Corolla pink. *Capsule* slender, cylindric, hispid, 1.5 in. long. *D. sp.*, Ridley in Journ. Linn. Soc. XXXII. 502.

JOHORE: at Gunong Panti, *Ridley* 4175.

2. *DIDISSANDRA FRUTESCENS*, Clarke in DC. Monog. Phan. V. i. 67, t. VII (1883). A shrub with woody stems, 3 to 4 ft. high; stems appressed hairy. *Leaves* opposite, in alternate pairs, distant; elliptic-lanceolate to oblanceolate, subacute at apex, cuneately narrowed at base; margins minutely crenulate; upper surface sprinkled with fine hairs, lower with appressed tawny silky hairs, especially on the nerves and reticulations; 7 to 9 in. long, 3 to 4 in. broad; main nerves about 12 to 20 pair; petiole 1.5 to 3 in. long, hairy. *Cymes* axillary, sessile, with short hairy branches 1 in. long; flowers 1 to 3 to each branch. *Calyx*-lobes red, hairy, narrow, lanceolate. *Corolla* white, 1.5 in. long; tube funnel-shaped, pubescent; lobes rounded. *Anthers* ovoid; filaments curved in the middle. *Ovary* glabrous; style pilose; stigma sub-bilobed. *Capsule* slender, cylindric, 3 in. long, glabrous, longitudinally ribbed. Clarke in Hook. f. Fl. Br. Ind. IV. 355; Ridley in Journ. Linn. Soc. XXXII. 502, and in Journ. Str. Br. R. As. Soc. No. 43, 21. *Didymocarpus frutescens*, Jack in Malay Misc. 1, part 2, 5, in Trans. Linn. Soc. XIV. 39, and in Calc. Journ. Nat. Hist. IV. 58 (1844); Wall. Cat. 780; R. Br. in Benn. Pl. Jav. Rar. 119, and in Ann. Sc. Nat. 2, XIII. 165; DC. Prodr. IX. 265; Miq. Fl. Ind. Bat. II. 726. *Henckelia frutescens*, Spreng. Syst., *curæ post.* 13.

PENANG: *Wallich* 780; *Curtis* 828; *Deschamps*. PERAK: at Tapa, *Wray* 826, at Waterfall Hill, *Wray* 1723; *Ridley* 2912; *Scortechini*; near Kinta River, *King's Collector* 837. DINDINGS: at Lumut, *Ridley* 7171. MALACCA: *Griffith* (K.D.) 3856; *Maingay* (K.D.) 1222.—DISTRIB. Sumatra.

3. *DIDISSANDRA HIRTA*, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 28 (1905). *Stem* woody, 3 in. long. *Leaves* oblanceolate, oblique, acuminate at apex, narrowed to the base; margins serrate; upper surface sprinkled with pale multicellular hairs, especially long on the marginal teeth; lower glabrous except on the midrib and nerves, which are covered with rather long multicellular hairs. *Scape* 3 to 4 in. long, hairy with catenulate multicellular hairs. *Calyx*-lobes .25 in. long, lanceolate, acuminate, very hairy. *Corolla* violet with a darker centre; tube 1 in. long, broad-cylindric, sprinkled with multicellular hairs; lobes large, rounded, .5 in. long, glabrous. *Stamens* 2 pairs, unequal. *Stigma* capitate.

PERAK: at Bujong Malacca, *Ridley*.

4. *DIDISSANDRA SERRATIFOLIA*, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 25 (1905.) *Stem* woody, 4 to 5 in. high, covered in the upper part with red hairs. *Leaves* opposite, oblanceolate, acuminate at apex,

long-cuneate at base; margins doubly serrate; upper surface sprinkled with pale multicellular hairs, lower glabrous except for the red multicellular hairs on the nerves and midrib; 6 to 10 in. long, 1.75 to 2.25 in. broad; main nerves 16 to 20 pairs; petiole 1 in. long or less, hairy. *Flowers* solitary on a slender hairy 4 in. long peduncle. *Calyx*-lobes lanceolate, acuminate, .25 in. long; recurved, at length covered densely with red multicellular hairs. *Corolla* blue, 1.5 in. long; tube narrowed at the base, dilated upwards, broad, sparingly hairy; lobes rounded, the lower ones longer than the upper. *Stamens* in 2 subequal pairs, half as long as the corolla-tube; filaments attached close to the base, sinuate. *Style* stout; stigma capitate. *Capsule* 1.5 in. long, subcylindric, thick, .125 in. broad, glabrous.

PERAK: at Bujong Malacca, *Ridley* 9779.

5. *DIDISSANDRA ATROCYANEA*, *Ridley* in Journ. Str. Br. R. As. Soc. No. 43, 26 (1905). *Stem* woody, about 6 in. high. *Leaves* crowded at the top of the stem, oblong or lanceolate-oblong, inæquilateral at the base; margins strongly serrate; black when dry; upper surface sprinkled with conical processes formed by the pushing in of the leaf from the under surface, each process bearing a short pale hair; lower surface punctate and marked with the mouths of the intrusions, glabrous except for the nerves and reticulations, which are covered with rufous hairs; 4 to 5 in. long, 1 to 2 in. broad; petiole winged to the base, covered with multicellular hairs. *Flowers* solitary on 3 in. long peduncles covered with red hairs. *Calyx*-lobes oblong ovate, glabrescent or with red hairs, .125 in. long. *Corolla* deep purple with almost black mouth, nearly 2 in. long; tube shortly narrowed at base, broadly cylindric above, pubescent; lobes short, rounded, the lower lip the longer. *Stamens* 4; filaments slender. *Capsule* glabrous, cylindric, curved, 1 to 2 in. long.

PERAK: at Bujong Malacca, *Ridley*, *Curtis* 3298; *Scortechini* 368, 1896; at Gunong Batu Putih, *Wray* 310.

6. *DIDISSANDRA LATISEPALA*, *Ridley* in Journ. Linn. Soc. XXXII. 503 (1895). *Stem* short, woody. *Leaves* crowded at the top of the stem, oblong-ob lanceolate, unequal at base; margins crenate-dentate; surfaces sparingly hispid, red; midrib and nerves beneath covered with red hairs; 7 in. long, 2 in. broad; petiole 1 in. long. *Flowers* few on a 6 in. long hispid peduncle. *Calyx*-lobes ovate, .125 in. long, glabrous. *Corolla* purple (?), 1 in. long, glabrous; tube cylindric, dilated upwards; lobes short, rounded. *Stamens* 4; filaments linear; anthers subglobose. *Ovary* glabrous; stigma clubbed. *Capsule* short, .5 in. long, thick, fusiform. *Ridley* in Journ. Str. Br. R. As. Soc. No. 43, 26.

LEGEH: *Machado*.

7. *DIDISSANDRA FLAMMEA*, Ridley in Journ. Linn. Soc. XXXII. 503 (1895). *Stem* about 2 in. long, hardly woody, pubescent. *Leaves* oblong, obtuse, glabrous; upper surface shining; margins and nerves beneath hairy; 4 in. long, 1.25 in. wide; petiole short, pubescent. *Flowers* few, pendulous on an erect stout, purple, pubescent peduncle 3 in. long. *Calyx*-lobes narrowly lanceolate, acuminate, green with purple hairs, .5 in. long. *Corolla* orange red with darker red lobes; tube narrow at base, abruptly dilated, cylindric, hairy outside; lobes short, rounded, the lower ones a little longer. *Stamens* in 2 pairs; filaments slender, terete, hispid above, white; anthers globose. *Ovary* white, pubescent, straight; stigma clavate. *Disk* annular. *Capsule* short, cylindric, purple, 1.5 in. long. Ridley in Journ. Str. Br. R. As. Soc. No. 43, 22.

LEGEH: gold mines north of Tringganu, *Machado*.

8. *DIDISSANDRA VIOLACEA*, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 23 (1905). *Stem* woody, about 6 in. high. *Leaves* tufted at the top of the stem, thin, oblanceolate, subfalcate, narrowed at the base into the petiole, acuminate at apex; margins sinuate; upper surface glabrous; midrib and petiole covered with red multicellular hairs; 4 to 7 in. long, 1 to 2 in. broad. *Flower*-peduncles numerous, erect, 2 to 3 in. long, sparingly red-hairy, 1-flowered; bracts linear-lanceolate, narrow, .25 to .5 in. long, closely appressed to the calyx. *Calyx*-lobes linear-lanceolate, glabrous, .25 to .5 in. long. *Corolla* violet, 1 to 1.5 in. long; tube rather narrow, gradually dilated upwards, sparingly pubescent; lobes unequal, the lower lip the longer. *Stamens* in 2 pairs, the longer pair scarcely one-fourth longer than the shorter. *Ovary* glabrous, rather short; stigma broad. *Capsule* 1.5 in. long, moderately thick, splitting along the upper edge.

PERAK: summit of Gunong Batu Patih, at 6700 ft., *Wray* 383; *Scortechini* 389.

This species comes near to *D. Wrayi*, but has smaller flowers.

9. *DIDISSANDRA ATROPURPUREA*, Ridley in Journ. Linn. Soc. XXXII. 504 (1895). *Stem* woody, 2 in. long. *Leaves* lanceolate or obovate, narrowed at the base, the bases unequal; margin obscurely crenate; upper surface glabrous, lower hairy on the raised nerves; 4 in. long, 1.5 in. broad; petiole 1 to 1.5 in. long. *Flowers* nearly sessile, in pairs on erect, glabrous, purple peduncles 3 to 5 in. long; bracts 2, ovate, .25 to .5 in. long, .125 in. wide, purple. *Calyx*-lobes nearly free to the base, lanceolate, acute, .25 to .35 in. long, glabrous. *Corolla* deep purple, 2 in. long, .5 in. broad, narrowed at the base, widely dilated

above; lobes short, rounded, the lower ones the longer. *Stamens* in 2 pairs; filaments straight; anthers oblong, appressed. *Style* thick, glabrous; stigma clavate. *Capsule* thick, 2 in. long, narrowed at the tip. Ridley in Journ. Str. Br. R. As. Soc. No. 43, 23.

PERAK: on rocks at Hermitage Hill, *Ridley*; at Gunong Inas, *Scortechini* 1327.

Wray 3903, from Gunong Bubu, 5000 ft., "flowers mauve, five white stripes in tube," may be this or a new species near it, but the flowers are solitary on the peduncles.

10. DIDISSANDRA WRAYI, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 24 (1905). *Stem* woody, bare below. *Leaves* alternate, lanceolate, oblique, acuminate at apex, narrowed at the base into the petiole; dentate on the margin; glabrous on the upper, whitish on the lower surface; 4 to 6 in. long, 1.5 to 2 in. broad; main nerves 16 pairs, raised on both surfaces; midrib and nerves beneath covered with coarse reddish trichomes; petiole .5 in. long, covered with rough multicellular trichomes. *Flowers* solitary, on 3 to 4 in. long slender peduncles from the upper axils, their bases covered with red multicellular hairs; bracts 2, ovate, broad, glabrous, appressed to the calyx, .25 in. long. *Calyx*-lobes broadly lanceolate, obtuse, glabrous, .5 in. long, white. *Corolla* white pencilled with violet, 1.25 to 1.5 in. long; tube thick, over .25 in. through; lobes broad, rounded. *Stamens* 4, didynamous; anthers rounded. *Style* short. *Capsule* slender, 1.5 to 2 in. long, glabrous.

PERAK: summit of Gunong Batu Putih, 6700 ft., *Wray* 334, 353; *King's Collector* 8036.

11. DIDISSANDRA QUERCIFOLIA, Ridley in Journ. Linn. Soc. XXXIII. 504 (1895). *Stem* woody, hairy, 6 in. long or less. *Leaves* crowded above, lanceolate-runcinate; base narrowed; upper surface deep green, glabrous; lower glaucous with the midrib and nerves covered with brown hairs; 2 to 8 in. long, 1 to 2 in. broad; petiole 1 in. long or less, hairy. *Flowers* large, 1 to 2 on 6 in. long sparsely hairy peduncles; bracts lanceolate, broad, hispid. *Calyx*-lobes broadly lanceolate, obtuse, green, glabrous. *Corolla* lemon-yellow, glabrous, 2 in. long; tube dilated, cylindric from a narrow base; lobes short, rounded. *Ovary* cylindric; stigma clavate. *Capsule* 3 in. long, glabrous, cylindric. Ridley in Journ. Str. Br. R. As. Soc. No. 43, 26.

PERAK: Bukit Rengas, *Fox* 10683; Maxwell's Hill, 3000 ft., *Scortechini* 292, 300; *Curtis* 2041; *Ridley* 2910.

King's Collector 2171, from Larút Hills, 3000 to 3500 ft., seems to be this, but is much larger, the stem whitish corky, nearly 12 in. long, the peduncles up to 4-flowered.

12. *DIDISSANDRA GLABRESCENS*, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 24 (1905). *Stem* woody. *Leaves* elliptic-lanceolate or oblanceolate; margins coarsely serrate; upper surface glabrous, lower dotted, glabrous except on the red hairy midrib and nerves; 4 to 7 in. long, 1 to 2.5 in. broad; petiole 1 in. long, hairy. *Flowers* solitary on 4 to 5 in. long hairy peduncles; bracts 1 to 2, lanceolate, oblong, .125 to .25 in. long. *Calyx*-lobes linear-lanceolate, obtuse, hairy, .25 to .5 in. long. *Corolla* mauve (*Wray*), deep blue (*King's Collector*), 1.5 in. long; tube gradually dilated upwards; lobes rounded, pubescent. *Anthers* subglobose. *Stigma* capitate, broad. *Capsule* 1.5 to 2.5 in. long, cylindric, slender.

PERAK: summit of Gunong Batu Putih, 6700 ft., *Wray* 384; do., 2000 to 3000 ft., *King's Collector* 8055; Kinta at 3000 to 3500 ft., *King's Collector* 7191.

13. *DIDISSANDRA FILICINA*, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 27 (1905). *Stem* woody, pale, rather slender. *Leaves* lanceolate, deeply lobed with oblong rounded lobes about 13 on each side; glabrous above, paler beneath, with red appressed hairs on the midrib; 3 to 5 in. long, 1 to 1.5 in. broad; petiole .5 in. long with red appressed hairs. *Flower* 1 on a slender, red, hairy peduncle 1.5 in. long; bracts very small, ovate, about .1 in. long; pedicel .25 in. long. *Calyx*-lobes elliptic, rounded, dark red, sparingly hairy, .1 to .2 in. long. *Corolla* 1.5 in. long; tube with narrow base, dilated upwards, trumpet-shaped, sparingly pubescent at the base, purple, paler below outside, inside dark purple, with 6 white lines down the base; lower lip longer than the upper; lobes rounded. *Stamens* 4, in 2 pairs, the connective prolonged in a triangular horizontal horn. *Disk* annular. *Capsule* sub-follicular, 1.5 in. long, glabrous.

PERAK: at Gunong Chabang, on rocks overhanging a creek, *Scortechini* 14.

4. *DIDYMOCARPUS*, Wall.

Herbs or usually small shrubs; stems simple or branched, erect or prostrate. *Leaves* herbaceous, opposite or the alternate ones reduced, seldom wanting, ovate or lanceolate, usually pubescent or hairy, petioled. *Peduncles* axillary, bearing one or more flowers in a cyme. *Calyx*-lobes 5, short, free to the base or nearly so. *Corolla* infundibuliform, bilabiate; lobes equal or the lower ones longer than the upper. *Stamens* 2 complete; filaments filiform, rising from about half-way down the tube; anthers reniform, connivent by the edges; stamino-odes 2, short, hooked. *Ovary* cylindric, passing into the style; stigma capitate or ovate, entire. *Disk* annular or absent. *Capsule* cylindric,

narrow, usually splitting along the upper edge. Seeds numerous, minute, ellipsoid, not plumed.—DISTRIB. Species about one hundred, in India and Malaya.

Sect. I. ELATÆ :—

- Stem tall, branched, shrubby; leaves in distant pairs,
unequal; bract 1, cupshaped 1. *D. corchorifolia*.
Stem long and weak; bracts 2, ovate 2. *D. sulphurea*.
Stem weak :—
Bracts ovate, amplexicaul; flowers yellow 3. *D. citrina*.
Bracts oblong, glabrous; flowers claret colour 4. *D. purpurea*.

Sect. II. DIDYMANTHUS :—

- Stem erect, herbaceous; leaves in distant pairs :—
Flowers very small, .25 in. long, axillary 5. *D. parviflora*.
Flowers medium-sized :—
Flowers yellow :—
Leaves lanceolate acute 6. *D. flava*.
Leaves ovate acuminate 7. *D. ramosa*.
Leaves unequal, narrowly lanceolate 8. *D. flavescens*.
Flowers white :—
Leaves opposite, equal, hairy, ovate :—
Edges pubescent 9. *D. hispida*.
Edges conspicuously red-hairy 10. *D. hirta*.
Leaves lanceolate, thinly pubescent 11. *D. viscida*.
Leaves subglabrous, equal, long-petioled 12. *D. albina*.
Leaves glabrous, unequal :—
Flowers solitary, on short peduncles 13. *D. alternans*.
Flowers in pairs on long peduncles from upper
axils 14. *D. glabrata*.

Stem erect, herbaceous, little-branched; flowers yellow;
corolla cylindric, trumpet-shaped :—

- Leaves petioled, silky, in distant pairs :—
Corolla 2 in. long 15. *D. malayana*.
Corolla 1 in. long 16. *D. albomarginata*.
Leaves crowded above, hairy :—
Stem slender; flowers small, congested 17. *D. flavobrunnea*.
Stem woody :—
Leaves glabrous, congested at the top, not petioled;
flowers yellow 18. *D. longipes*.
Leaves alternate lanceolate, inæquilateral; flowers
blue 19. *D. inequalis*.
Leaves crowded or distant, elliptic, petioled;
flowers white 20. *D. alba*.

Sect. III. REPTANTES. Prostrate or creeping herbs. Leaves
in distant pairs, equal or unequal, hairy or pubescent :—

- Flowers blue or white, sometimes with yellow streaks :—
Leaves hairy, rarely glabrous; flower in uppermost
axil, peduncle short 21. *D. reptans*.

Leaves velvety, elliptic :—

- Flowers solitary, terminal 22. *D. ophirensis*.
 Flowers numerous, on slender pedicels 23. *D. pulchella*.

Flowers orange-yellow :—

- Calyx-lobes hairy 24. *D. crocea*.
 Calyx-lobes narrow, subglabrous 25. *D. ascendens*.

Sect. IV. HETEROBÆA. Stems woody, usually short, with the leaves crowded towards the top, more or less hairy above, and little or not branched. Leaves hairy, silky or rarely glabrous, lanceolate, serrate, narrowed at the base into a winged petiole, alternate. Peduncles slender, axillary in the upper axils, 1- rarely 2-flowered. Bracts usually small, solitary, linear. Corolla large, showy; white crimson or blue, rarely yellow; filaments long, slender. Capsule narrow, cylindric :—

Flowers solitary, bracts very small :—

- Leaves glabrous, wrinkled 26. *D. rugosa*.

Leaves tessellate, not wrinkled, obovate, glabrous or with scattered hairs with swollen bases :—

- Capsule over 2 in. long 27. *D. platypus*.
 Capsule shorter, 1 in. long 28. *D. Kompsobæa*.

Leaves not tessellate, hairy or pubescent.

Leaves broad, covered with close short hairs :—

- Flowers white, tipped with crimson 29. *D. quinquevulnera*.
 Flowers deep crimson 30. *D. atrosanguinea*.

Leaves narrow, lanceolate, densely hairy, distant;

- flowers yellow 31. *D. hirsuta*.

Leaves silky pubescent on both surfaces; flowers

- white, tinged with pink or blue 32. *D. bombycina*.

Leaves crowded, thickly appressed, hairy; flowers

- white or blue 33. *D. crinita*.

Leaves crowded, covered with short scattered hairs

above, deep green with central white bar; flowers

- white 34. *D. fasciata*.

- Flowers in pairs on a long peduncle; bracts very broad 35. *D. venusta*.

Sect. V. SALICINÆ. Small shrubby plants with narrow leaves crowded at top. Flowers small :—

- Leaves entire 36. *D. densifolia*.

Leaves serrate :—

- Flowers .125 in. long, pink 37. *D. salicina*.

Flowers .75 in. long, white with purple outside, yellow

- in mouth 38. *D. serratifolia*.

Leaves deeply cut, pinnate 39. *D. pectinata*.

Sect. VI. ACAULES. Stemless or nearly so; leaves crowded :—

- Flowers panicled, lips very unequal 40. *D. violacea*.

Flowers 1- 2-racemose :—

- Flowers large, blue 41. *D. lacunosa*.

Flowers small :—

- Leaves elliptic, peltate 42. *D. perdita*.

Leaves obovate, crenulate :—

Capsule very short and broad 43. *D. puncticulata*.

Capsule linear, narrow 44. *D. heterophylla*.

Leaves small, entire, silky 45. *D. pumila*.

Affinity doubtful.

Stem tall; leaves alternate, distant. Panicles small,

adnate to petioles 46. *D. lilacina*.

Sect. I. ELATÆ.

1. DIDYMOCARPUS CORCHORIFOLIA, R. Br. in Benn. Pl. Jav. Rar. 119 (1840). A shrub, 4 to 6 ft. high, much branched, with a stout woody stem. *Leaves* opposite but unequal, ovate, subacute, inæquilateral, rounded at base; margins serrate; both surfaces, but especially the under, covered with soft, short, felted hair; 3 to 9 in. long, 1.5 to 5 in. broad; petiole 1 to 3 in. long. *Panicles* lax, axillary, 2 to 3 in. long; peduncles short, pubescent; flowers numerous; bracts cupshaped. *Calyx* cupshaped, .25 in. long, shortly 5-toothed. *Corolla* .75 in. long, white applegreen in the throat or often purplish-white; tube straight, thick; lobes rounded, the upper lip recurved, the base appressed to the broad decurved lower lip which is much longer. *Capsule* cylindric, 1 to 2.5 in. long, pubescent, splitting to near the tip. Ann. Sc. Nat. 2, XIII. 164; Wall. Cat. 792; DC. Prodr. IX. 265; Miq. Fl. Ind. Bat. II. 726; Clarke in DC. Monog. Phan. V. i. 85, and in Hook. f. Fl. Br. Ind. IV. 351; Ridley in Journ. Bot. XXVIII. 68 (1890), and in Journ. Str. Br. R. As. Soc. No. 43, 31.

PENANG: *Wallich* 792; Government Hill, *Curtis* 1239; *Maingay* (K.D.) 1227. SELANGOR: Pahang track and Semangko, *Ridley* 8553. PERAK: Bujong Malacca, *Ridley* 9775, *Curtis* 3130; Gunong Hijau, *Scortechini* 1266; Kinta, at 1500 to 2000 ft., *King's Collector* 7220; 2000 to 3000 ft., *King's Collector* 10979, 10998.

2. DIDYMOCARPUS SULPHUREA, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 32 (1905). A shrubby creeper 6 to 10 ft. long; stem pubescent, branched, with long internodes. *Leaves* opposite but very unequal, one up to 3 in. long by .75 to 1.75 in. broad, the opposite one .5 to .75 in. long, .15 to .25 in. wide; ovate or lanceolate, acute; base unequal, cuneate; margins crenulate dentate; deep green above, purple beneath; nerves 6 to 7 pairs elevated on both surfaces, sprinkled all over on both surfaces with short hairs, more hairy on the back. *Peduncles* axillary, filiform, 4 to 6 in. long, pubescent; branches at the top 2 or 3, each bearing as many flowers; bracts 2 to each pair of flowers, ovate, glabrous, .125 in. long. *Calyx*-lobes elliptic-ovate, obtuse, glabrous. *Corolla* infundibuliform, .5 in. long, glabrous; upper lip short recurved, lower one longer. *Stamens* shortly exsert; filaments thick, pubescent.

Style stout; stigma excavate at the top. *Capsule* 1·5 to 3 in. long, rather thick, cylindric, acuminate, glabrous.

PERAK: Gunong Hijau, Gunong Chabang and Gunong Bubu, *Scortechini* 6; Gunong Batu Patih, at 3000 to 4000 ft., *King's Collector* 8059; do. 4500 ft., *Wray* 219; Bujong Malacca, *Ridley* 9774.

VAR. *breviflora*, *Ridley* l.c. Bracts and calyx-lobes narrower, acute, pubescent. *Corolla* smaller, ·25 to ·5 in. long. *Capsule* pubescent, ·75 in. long.

SELANGOR: Bukit Kutu, *Ridley* 7582.

3. DIDYMOCARPUS CITRINA, *Ridley* in Journ. Linn. Soc. XXXII. 508 (1895). A soft weak herb, about 1 ft. high, pubescent. *Leaves* soft, opposite but unequal, the larger 2 to 3 in. long, 1·25 in. wide; ovate or ovate-lanceolate; velvety; margins crenulate; petiole ·5 to 3 in. long. *Panicles* axillary, 3 in. long, pubescent at base, glabrate above; bracts ovate cordate, acute, nearly amplexicaul, polished green with red edges; pedicels ·5 to 1 in. long, terete, glabrous. *Calyx*-lobes triangular, spreading, stiff, green, edges red. *Corolla* lemon-yellow, pendulous; tube 1 in. long, funnel-shaped, base narrowed, mouth dilate, ·5 in. across; upper lobes broad, rounded, recurved. lower ones larger. *Stamens* 2; filaments short, sinuate, pubescent; anthers subtriangular. *Ovary* and style ·5 in. long, pubescent; stigma peltate. *Disk* cylindric. *Capsule* 1 in. long, angled, glabrous. Journ. Str. Br. R. As. Soc. No. 43, 32.

KEDAH: Gunong Jereh, at 2000 ft. alt., *Ridley* 5518.

4. DIDYMOCARPUS PURPUREA, *Ridley* in Journ. Linn. Soc. XXXII. 508 (1895). *Stem* herbaceous, 12 to 18 in. high. *Leaves* ovate, acute, inæquilateral, velvety; 4 in. long, 2 in. broad; margins crenulate; petiole ·25 to ·5 in. long. *Panicle* erect, subterminal, 4 in. long, with slender branches; peduncle 3 in. long, glabrous; bracts small, ovate. *Calyx*-lobes spreading, oblong, glabrous, short. *Corolla* tubular, purple; tube narrowed at base; lobes rounded, lower ones longer. *Stamens* 2; filaments filiform, included; staminodes filiform. *Ovary* cylindric; stigma broad, discoid. *Capsule* ·5 in. long, cylindric, glabrous, stipitate. Journ. Str. Br. R. As. Soc. No. 43, 33.

KEDAH: Lankawi Island on Gunong Chinchau, 1000 to 1500 ft., *Curtis* 2567.

Sect. II. DIDYMANTHUS.

5. DIDYMOCARPUS PARVIFLORA, *Ridley* in Journ. Str. Br. R. As. Soc. No. 43, 33 (1905). A small erect herb about 1 ft. high or less, much branched; stem slender, covered with appressed hairs. *Leaves* opposite, equal; lanceolate, acute; 1 in. long, ·25 in. broad; glabrous and punctulate on the upper surface, on the lower yellow pustular and

with short translucent hairs which are longer and multicellular along the margin, midrib and nerves; nerves 5 pairs; petiole .25 in. long, hairy. *Flowers* solitary, axillary on slender hairy peduncles .25 in. long. *Calyx*-lobes linear, obtuse, pubescent. *Corolla* .25 in. long, yellow-pubescent; tube broad, straight; lobes short, broad, rounded. *Stamens* nearly as long as corolla-lobes; anthers large, white, reniform; filaments glabrous. *Ovary* as long as stamens, pubescent; stigma capitate, entire. *Capsule* slender, pubescent.

NEGRI SEMBILAN: at Gunong Angsi, *Ridley*.

6. DIDYMOCARPUS FLAVA, *Ridley* in Journ. Linn. Soc. XXXII. 507 (1895). *Stem* 1 ft. tall, scabrid, branched. *Leaves* lanceolate acute, base narrowed; denticulate on the margins; scabrid beneath, covered on the nerves with short hairs; 3 in. long, 1.5 in. broad; petiole .5 in. long. *Cymes* axillary and subterminal, on hairy peduncles 1 to 2 in. long; pedicels .5 in. long; flowers 4 or 5. *Calyx* short; lobes hispid lanceolate. *Corolla* glabrescent, yellow, .75 in. long; tube straight, dilated upwards; lobes short, obtuse. *Style* slender, pubescent. *Capsule* cylindrical, 1.5 in. long, hispid. *Ridley* in Journ. Str. Br. R. As. Soc. No. 43, 34.

PERAK: Larut Hills, *Ridley* 2914; *Curtis* 2690; at 2500 to 3000 ft., *King's Collector* 2151; *Scortechini* 563.

VAR. *purpurascens*, *Ridley*. *Stems* stouter, over 1 ft. high, hairy. *Leaves* opposite, equal, obliquely ovate acute, often purple as is the stem.

PERAK: Bukit Kapayung, Sungei Siput, *Ridley*.

7. DIDYMOCARPUS RAMOSA, *Ridley* in Journ. Str. Br. R. As. Soc. No. 43, 34 (1905). *Stem* slender, branched, pubescent with appressed hairs, over 1 ft. tall. *Leaves* distant, opposite, but one of each pair much smaller; ovate acuminate, thin, rounded or slightly narrowed at the base; glabrous above, sparingly hairy on the nerves beneath; nerves about 7 pairs; 2 to 3 in. long, 1.5 in. wide or smaller; petiole .125 in. long. *Peduncles* slender, from the lower axils, 1.25 in. long, 2-flowered, viscid hairy. *Calyx*-lobes lanceolate acuminate, viscid hairy, .125 in. long. *Corolla*-tube straight, hardly dilated, .5 in. long, greenish yellow, bilabiate; lower lobe longer than upper; lobes rounded. *Stamens* 2; filaments long filiform; anthers oblong. *Ovary* long-cylindrical; style long, slender; stigma capitate, small.

PERAK: Gunong Batu Putih, *Wray* 868.

8. DIDYMOCARPUS FLAVESCENS, *Ridley* in Journ. Str. Br. R. As. Soc. No. 43, 35 (1905). *Stems* slender, over 1 ft. long, covered with short appressed hairs. *Leaves* distant, opposite but unequal; lanceolate, acuminate at both ends, entire; sprinkled over on both surfaces with

short scattered hairs; 1.5 to 2 in. long, .5 in. wide; petiole .15 to .2 in. long, silky-hairy. *Peduncles* 1-flowered, slender, subterminal, 1 in. long, pubescent. *Calyx*-lobes linear, hairy. *Corolla* yellowish-white, .5 in. long, pubescent; tube straight, cylindric, hardly dilated above; bilabiate; lobes short, rounded. *Stamens* 2; filaments filiform. *Ovary* short, cylindric; style short, pubescent; stigma capitate.

SELANGOR: Kwala Kubu, *Ridley* 7585.

9. DIDYMOCARPUS HISPIDA, *Ridley* in *Journ. Linn. Soc.* XXXII. 507. (1895). *Stem* 6 to 12 in. tall, hispid. *Leaves* opposite, equal; ovate or lanceolate, acute or acuminate at both ends; 3 to 5 in. long, 1 to 2 in. wide; scabrid on the upper surface, hairy on the lower, especially on the nerves; petiole 1 in. long. *Peduncles* 1 to 3, erect from the upper axils, 3 in. long, hairy, with 3 or 4 terminal branches, bearing a few flowers; pedicels hispid, .5 in. long; bracts linear, .25 in. long. *Calyx* .25 in. long; lobes lanceolate, hairy. *Corolla* glabrous, 1 in. long, white with violet streaks in the lower lip; tube straight, funnel-shaped; upper lobes ovate subacute, lower ones longer. *Stamens* 2; filaments slender, nearly straight, filiform; staminodes short, clubbed, 2. *Ovary* fusiform, pubescent; style terete; stigma capitate. *Capsule* 1.5 in. long, straight, cylindric. *D. hispidula*, *Ridley* in *Journ. Str. Br. R. As. Soc.* No. 43, 35.

PERAK: Larut Hills at 4000 to 6000 ft., *Curtis* 1312, 2037; *Ridley*; *King's Collector*; *Scortechini* 467?

VAR. ? *selangorensis*, *Ridley*. *Leaves* shorter, glabrous above. *Calyx*-lobes longer. *Capsule* 3 in. long, softly velvety.

SELANGOR: Gunong Semangko, *Curtis* 3752.

10. DIDYMOCARPUS HIRTA, *Ridley* in *Journ. Str. Br. R. As. Soc.* No. 43, 36 (1905). *Stem* herbaceous, branched, about 1 ft. tall, thickly covered with rather long reddish multicellular hairs. *Leaves* opposite; ovate or ovate-lanceolate, subacute, narrowed at the base; 3 in. long, 1 to 1.5 in. wide; margin serrulate, hairy; rather densely hairy on the upper surface with multicellular hairs; on the lower surface, midrib, and nerves covered with close long pale hairs; petiole .25 in. long, hairy. *Peduncles* subterminal, 2.5 in. long, very hairy, red; bract very small, linear; flowers solitary on the peduncles. *Calyx*-lobes linear, narrow, hairy, .15 to .2 in. long. *Corolla* absent. *Capsule* 2 in. long, cylindric, closely but very shortly hairy. *Ovary* cylindric; style long, pubescent; stigma discoid.

SELANGOR: above the gap, Semangko Pass, *Curtis*.

11. DIDYMOCARPUS VISCIDA, *Ridley* in *Journ. Str. Br. R. As. Soc.* No. 43, 36 (1905). *Stems* slender, 6 in. long or more; shortly roughly hairy. *Leaves* opposite, thin; lanceolate or ovate-lanceolate, acuminate; base inaequilateral; upper surface sparingly scabrid hairy, lower hairy on

the nerves; 3 to 4 in. long, 1 to 1.5 in. broad; main nerves about 6 pairs; petiole .5 in. long, roughly hairy. *Peduncle* subterminal, 2 in. long, viscid hairy; cyme-branches 1 in. long. *Calyx*-lobes very short, lanceolate, viscid hairy. *Corolla* rather over .5 in. long; tube swollen at base, then funnel-shaped, white, sparingly pubescent. *Stamens* 2, included; filaments filiform. *Style* shorter than stamens. *Capsule* slender, cylindric, acuminate, viscid hairy, 1 in. long.

PERAK: Gunong Keledang, *Ridley* 9781.

12. DIDYMOCARPUS ALBINA, *Ridley* in Journ. Str. Br. R. As. Soc. No. 43, 37 (1905). *Stem* 2 to 3 ft. tall, herbaceous, appressed hairy. *Leaves* opposite, equal; lanceolate or ovate-lanceolate, acuminate at base and apex; margins shortly serrate; 4 to 6 in. long by 1.5 to 2 in. wide; glabrous except the midrib on the back, which is covered with appressed hairs; petiole appressed hairy, 1.5 in. long. *Peduncle* axillary, 3 in. long, with a lax few-branched terminal panicle 1 in. long; bracts and bracteoles linear. *Calyx*-lobes lanceolate acuminate, .1 in. long. *Corolla* .5 in. long, waxy white, slightly pubescent; tube cylindric; limb distinctly bilobed. *Stamens* 2; filaments glabrous; anthers ovate-lanceolate. *Ovary* and style pubescent.

PERAK: Gunong Batu Putih, at 3000 to 4000 ft., *King's Collector* 8070.

This is allied to *D. hispida*, *Ridl.*, but with nearly glabrous and more lanceolate leaves and smaller flowers.

13. DIDYMOCARPUS ALTERNANS, *Ridley* in Journ. Str. Br. R. As. Soc. No. 43, 37 (1905). *Stem* about 1 ft. tall, erect, scabrid hairy above, rather slender. *Leaves* thin; subalternate or opposite; lanceolate acuminate; base inaequilateral cuneate; entire or slightly serrate; 3 in. long by 1.25 in. wide; nearly glabrous except the midrib on the back and petiole, .25 in. long, which are scabrid hairy; opposite leaf reduced to a small ovate blade .5 in. long or wanting. *Flowers* solitary, axillary on short pedicels, slender, .125 to .25 in. long with 2 linear small bracts, all pubescent. *Calyx*-lobes lanceolate acute, hairy, .125 in. long. *Corolla* .5 in. long, white, centre yellow; tube narrowed at the base, dilated upwards, pubescent; lobes subequal, rounded; lips not very distinct. *Stamens* 2; filaments filiform, included; anthers elliptic, connate; staminodes filiform, short, clubbed. *Style* fairly long, hairy; stigma capitate. *Capsule* slender, cylindric, glabrous, 1 in. long.

PERAK: at Bujong Malacca, *Ridley* 9777; *Curtis* 3133; Larut Hills, 500 to 1500 ft., *King's Collector* 2311. On banks up to 4000 ft.

14. DIDYMOCARPUS GLABRATA, *Ridley* in Journ. Str. Br. R. As. Soc. No. 43, 38 (1905). A slender branched herb over 1 ft. high, almost

glabrous except for a little pubescence on the stem and petioles. *Leaves* opposite, subequal or one leaf larger than the other; elliptic or ovate, apex subacute, base cuneate or rounded and oblique; margins entire; 1.5 to 3 in. long, 1 in. broad or less; main nerves 7 pair, with midrib pubescent; petiole slender, pubescent, .25 in. long or less. *Peduncles* from the upper axils 2-flowered, axillary, 2 in. long, pubescent; bracts very small, linear; pedicels .25 in. long, pubescent. *Calyx*-lobes narrowly lanceolate, .125 in. long. *Corolla* white (not seen). *Capsule* linear, acuminate, 1.5 in. long, pubescent.

JOHORE: at Gunong Panti, *King's Collector* 209.

15. DIDYMOCARPUS MALAYANA, Hook. f. in Gard. Chron. II. 123, fig. 24 (1896). *Stem* very short, up to 3 in. long. *Leaves* ovate obtuse shortly petioled to lanceolate acute, long-petioled; 7 in. long, 2.75 in. broad; main nerves 15 pairs, conspicuous, silky-hairy. *Peduncles* stout, silky-hairy, 3 to 4 in. long, scape with 2 flowers at the top or with 2 erect branches 3 in. long bearing 8 or 9 flowers each; flowers nodding. *Calyx*-lobes linear, obtuse, pubescent, long. *Corolla* 2 in. long, bright yellow; tube narrowed at the base, gibbous, inflated above, hairy; lobes rounded, subequal. *Stamens* 2; filaments included, curved, glabrous; anthers shield-shaped with 2 projecting horns on each; staminodes minute, tooth-like. *Ovary* conic, hairy; style long, glandular-pubescent; stigma capitate. *Disk* cylindrical. *Capsule* cylindrical, 1 to 1.5 in. long. Bot. Mag. t. 7526; Ridley in Journ. Str. Br. R. As. Soc. No. 43, 38.

PERAK: Bujong Malacca, *Curtis* 3300, *Ridley* 9778; Tanjong Malim, *Baldwin*; Chabong, *Scortechini* 189; Ulu Bubong and Ulu Kirling, *King's Collector* 8799?, 10197? SELANGOR: Gunong Semangko, *Curtis* 3300; Bukit Kutu, *Ridley* 7580; Ginting Bidai, *Ridley* 7581. Usually at 1500 to 3000 ft. alt.

16. DIDYMOCARPUS ALBOMARGINATA, Hemsley in Journ. Bot. XXV. 204 (1887). *Stem* 6 to 12 in. tall, pubescent, red. *Leaves* elliptic or ovate, obtuse, with a broad or cuneate base, dark green; edges and nerves white, sparsely hairy above, silky beneath; nerves about 10 pairs; 3 to 4 in. long, 1 to 1.5 in. wide. *Peduncles* axillary and subterminal, hairy, pink, 3 in. long, racemose or sparingly branched. *Calyx*-lobes lanceolate, hairy. *Corolla* yellow; tube narrow, pinkish white, dilated upwards; lobes subequal, rounded. *Stamens* 2; filaments thickened at the base, curved; anthers reniform with short processes; staminodes 2, filiform, hooked. *Ovary* cylindrical, conic, pubescent; style long; stigma wide, discoid. *Capsule* cylindrical, acuminate, rather thick; tip upcurved, hairy, .75 in. long. *Ridley* in Journ. Linn. Soc. XXXII. 506, and in Journ. Str. Br. R. As. Soc. No. 43, 39.

PERAK: Larút Hills, 3000 to 5000 ft., Wray; Curtis 2039, 2991; Ridley 2908; King's Collector 1817.

A species closely allied to *D. malayana*, and difficult to distinguish from it in dried specimens except from the much smaller flowers.

17. *DIDYMOCARPUS FLAVOBRUNNEA*, Ridley in Trans. Linn. Soc. Ser. 2, III. 329 (1893). *Stem* slender, seldom branched, densely pubescent, 3 to 4 in. tall. *Leaves* alternate; ovate lanceolate, acute; base unequal narrowed; margins serrate; 7 in. long, 3 in. wide; nerves and midrib beneath covered with shining brown hairs, above sparingly pubescent. *Peduncles* 8 in. long, stiff, hispid, branched shortly dichotomously above; branches short, crowded; flowers numerous, small; bracts lanceolate, acuminate, .25 in. long, hispid; pedicels short. *Calyx*-lobes linear, narrow, pubescent. *Corolla* 1 in. long; tube cylindric, gradually dilated towards the lips; lobes unequal, rounded, short; tube brownish outside; limb yellow with an orange spot in the mouth and some red streaks. *Stamens* 2, with filiform filaments. *Ovary* elliptic. *Capsule* 1 in. long, narrowed gradually from the base, splitting above nearly to the apex, glabrous. Journ. Str. Br. R. As. Soc. No. 43, 39.

PAHANG: Tahan River woods, Ridley 2163.

The fruits crowded at the top of the peduncle radiating in all directions give this species the appearance of a *Parabæa*.

18. *DIDYMOCARPUS LONGIPES*, Clarke in DC. Monog. Phan. V. i. 86 (1883). *Stem* woody, 2 in. long, hairy at the top. *Leaves* oblanceolate, narrowed to the base; obscurely serrate; glabrous and deep green above, hairy on the midrib and purple beneath; 8 in. long, 2.25 in. broad. *Flowers* few, racemose (occasionally paniced), pendent on peduncles 9 to 18 in. long, rather stout, purple. *Calyx*-lobes linear, acuminate, pubescent, purple, .125 in. long. *Corolla* 1.5 in. long, pale yellow, pubescent; tube straight, little dilated upwards; upper two lobes short, rounded; lower longer, oblong. *Stamens* 2; filaments short, thick, adnate to the tube near the mouth; anthers reniform, connate, just included, with 2 short appressed horn-like processes to the connective. *Ovary* elongate, conic, passing into the terete style; stigma discoid. *Disk* cylindric. *Capsule* 1.25 in. long, rather thick, splitting along the upper edge. Clarke in Hook. f. Fl. Br. Ind. IV. 351; Ridley in Journ. Linn. Soc. XXXII. 509, and in Journ. Str. Br. R. As. Soc. No. 43, 40.

MALACCA: Mount Ophir, Griffith (K.D.) 3854; Cuming 2385; Main-gay (K.D.) 2723; Ridley 3179.

19. *DIDYMOCARPUS INÆQUALIS*, Ridley in Journ. Linn. Soc. XXXII. 506 (1883). *Stem* woody, 5 in. or more tall, .125 in. thick, brown-

pubescent. *Leaves* alternate, distant, lanceolate, inæquilateral, acute, serrate, narrowed to the base; velvety above, pubescent beneath; 5 in. long, 1·5 in. wide or smaller; petiole distinct, pubescent, ·5 in. long. *Peduncles* from the upper axils 1·5 in. long, pubescent; flowers crowded, pedicellate; bract linear, nearly ·25 in. long. *Calyx* campanulate; lobes not free to the base, linear, ·125 in. long, pubescent. *Corolla* blue, 1 in. long; tube slender, enlarged upwards; lobes short, rounded; filaments long slender. *Ovary* elongate cylindric; stigma obconic. *Capsule* cylindric, glabrous, 1·5 in. long. Ridley in Journ. Str. Br. R. As. Soc. No. 43, 41.

KEDAH: on Lankawi Island at Gunong Chinchang, *Curtis* 2568.

20. DIDYMOCARPUS ALBA, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 41 (1905). *Stem* woody, creeping, ascending, hairy-pubescent. *Leaves* crowded towards the top; lanceolate, acute at base; 2 in. long, ·25 to ·5 in. wide, softly densely hairy on both sides; petiole densely hairy, ·5 in. long. *Peduncles* short, ·5 in. or less long, 1-flowered, densely hairy. *Calyx*-lobes free to base, linear, acuminate, long-hairy, ·125 in. long. *Corolla* quite white, ·5 in. long, base cylindric, gradually dilated upwards, hairy; lobes short, rounded, subequal. *Stamens* 2; filaments rather short, filiform; staminodes 3, filiform, clubbed, shorter. *Ovary* pubescent. *Capsule* ·75 in. long, curved, acuminate, splitting along the upper surface, glabrous.

PERAK: at Bujong Malacca, *Curtis* 3299; *Ridley* 9780; *Scortechini*.

VAR. *major*, Ridley. *Stems* taller, over 1 ft. high. *Leaves* more remote and less hairy. *Peduncles* longer, 1 in. in flower, 1·25 in. in fruit. *Corolla* 1 in. long.

PERAK: at Gunong Bubu, 4500 ft., *Wray* 3209.

Sect. III. REPTANTES.

21. DIDYMOCARPUS REPTANS, Jack in Mal. Misc. I. pt. ii. 3 (1820), and in Trans. Linn. Soc. XIV. 35. *Stems* creeping, 6 in. or more long, villous. *Leaves* opposite; ovate or elliptic, blunt at apex, narrowed or rounded at base; upper surface sprinkled with villous hairs, lower more hairy; margins obscurely crenulate; ·75 to 3 in. long, ·5 to ·75 in. broad. *Peduncles* slender, subterminal, 1-flowered, hairy, 1 in. long; bract very small; pedicel ·25 in. long. *Calyx*-lobes linear, villous, ·125 in. long. *Corolla* ·5 in. long, pubescent, white with purple and yellow streaks in the mouth; tube trumpet-shaped; lobes rather large, rounded. *Stamens* 2; filaments far included, filiform; staminodes very short. *Ovary* cylindric; style slender; stigma discoid. *Capsule* 1 in. long, slender, scabrid, splitting nearly to the apex. Calc. Journ. Nat. Hist. IV. 55; Spreng.

Syst. II. 837; Wall. Cat. 787; G. Don Gen. Syst. Dichl. Pl. IV. 659; R. Br. in Benn. Pl. Jav. Rar. 119, and Am. Sc. Nat. 2, XIII. 164; DC. Prodr. IX. 286; Miq. Fl. Ind. Bat. II. 726; Clarke in DC. Monog. Phan. V. i. 95, and in Hook. f. Fl. Br. Ind. IV. 352; Ridley in Journ. Linn. Soc. XXXII. 511, and in Journ. Str. Br. R. As. Soc. No. 43, 42. *Henckelia reptans*, Spreng. Syst. curæ post. 14.

PENANG: Wallich 787; Maingay (K.D.) 1223; Lobb 335; at Pulau Betong, Curtis 1706; Penang Hill, G. King. SELANGOR: Bukit Kutu, Ridley 7585.

VAR. *monticola*, Ridley. More slender, and creeping for 1·5 ft. or more; the shoots covered with rufous hairs. Leaves narrower, lanceolate, acute, narrowed into the petiole; 2 to 3 in. long, ·3 to ·5 in. broad. *D. ? producta*, Clarke in DC. Monog. Phan. V. i. 96.

PERAK: Gunong Batu Putih, Wray 480, 927; Larut Hills Curtis 2040, 2992; Ridley 2912; Scortechini 20, 257; Goping, King's Collector 1099. DINDINGS: Simpiti, near Lumut, Ridley 3062. SELANGOR: Pahang track, Ridley 8561; Ginting Bidai, Ridley 7586. NEGRI SEMBILAN: Bukit Tamiang and Bukit Sulu, Cantley's Collector.—DISTRIB. Sumatra (Horsfield).

VAR. *violascens*, Ridley. Stems ascending for 1 ft. or so. Leaves rather remote, nearly glabrous above except for dense hair on the margins and midrib, more hairy beneath; nerves elevated, densely appressed-hairy. Flowers purplish-white.

SELANGOR: Rawang, Ridley 7583; Dusun Tera, Ridley 7584.

22. DIDYMOCARPUS OPHIRENSIS, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 43 (1905). Stem creeping, over 1 ft. long. Leaves opposite, somewhat unequal, elliptic; dark green with white on the nerves, 1 to 3 in. long, ·5 to 1 in. wide, base rounded; above sprinkled with short hairs, beneath paler, more hairy; margins entire, thickly hairy; nerves 5 to 6 pairs, densely hairy; petiole ·25 in. long, hairy. Peduncles subterminal, 1 in. long, hairy. Calyx-lobes linear, ·125 in. long, densely hairy. Corolla ·75 in. long, gradually dilated forwards, rather broad at the top, hairy, purple and white; upper lip much shorter than lower one. Stamens filiform, little shorter than the corolla. Style slender; stigma capitate. Capsule cylindric, hairy, 1 in. long.

MALACCA: lower part of Mount Ophir, Ridley 3185.

Ridley says: "I took this at first to be *D. marginata*, Clarke in DC. Monog. Phan. V. i. 96, and in Hook. f. Fl. Br. Ind. IV. 352, which was based on a plant collected in Malacca or Luzon by Lobb, but which, from the description, may be a form of *D. reptans*, and the locality of which is doubtful."

23. DIDYMOCARPUS PULCHELLA, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 44 (1905). Stems slender, 3 to 6 in. long, purple, covered with

appressed hairs. *Leaves* opposite, elliptic, obtuse, 1 to 2 in. long; dark green above with a central white stripe, dotted with short hairs; beneath purple, sprinkled with hairs; the nerves and edges hairy; petiole .25 to .5 in. long, hairy. *Peduncles* axillary, 1 in. long, slender, hairy; bract linear, very small; pedicel .5 in. long, slender, hairy. *Calyx*-lobes narrowed, linear, .125 in. long, hairy. *Corolla* white, with yellow in the mouth, nearly 1 in. long; tube cylindric, hardly dilated, sparingly hairy; lobes oblong, rounded. *Stamens* 2 fertile; filaments filiform, straight; anthers oblong. *Ovary* slender, cylindric, pubescent, with style .4 in. long. *Capsule* narrow, cylindric, upcurved, 1.5 in. long, pubescent.

PAHANG: Kwala Lipis, *Machado* 11629.

24. DIDYMOCARPUS CROCEA, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 44 (1905). *Stems* succulent, creeping, pubescent, 1 ft. or more long. *Leaves* opposite but unequal; ovate, obtuse; surface softly hairy, green with white veins; 1 to 3 in. long, .75 to 1.25 in. broad; nerves raised beneath; petiole .5 in. long or less. *Peduncles* subterminal, 1 to 3 in. long, 1-flowered, softly hairy; bracts 2, short, linear. *Calyx*-lobes linear, pubescent, .15 to .2 in. long. *Corolla* orange-yellow, pubescent, bilabiate, 2 in. long; tube narrowed at the base, dilated, gibbous above; lobes rounded, darker orange; lower lip longer than upper. *Stamens* 2; filaments sinuate; anthers with 2 processes each on the back; staminodes filiform, hooked. *Style* slender; stigma capitate. *Capsule* rather thick, curved upwards, 1.25 in. long, pubescent.

PERAK: Gunong Keledang, on banks, *Ridley* 9776; *Curtis* 3301; Sungkei, *King's Collector* 3014.

25. DIDYMOCARPUS ASCENDENS, Ridley in Journ. Linn. Soc. XXXII. 512 (1896). *Stem* rather slender, creeping, ascending, branched above, 4 to 8 in. high; branches 2 in. long or more. *Leaves* crowded above, opposite, subequal; ovate, subacute, narrowed or broad at base, entire; surface dark green, silky-hairy, the edges white-silky; 1.5 to 2 in. long, .5 to 1 in. broad; petiole 1 in. long or less. *Flowers* solitary on hairy peduncles .5 to 1 in. long. *Calyx*-lobes linear, acuminate, silky. *Corolla* orange-yellow, 1.5 in. long, narrow cylindric, dilated above, pubescent; lobes short, rounded, subequal. *Stamens* 2; filaments long, thick; anthers triangular, obtuse. *Ovary* cylindric, pubescent; style long; stigma ovate, triangular. *Capsule* cylindric, acuminate, 1 in. long. Ridley in Journ. Str. Br. R. As. Soc. No. 43, 45.

PERAK: Tapa, *Haviland*; *Curtis* 3106; Goping, *King's Collector* 458.

Sect. IV. HETEROBÆA.

26. DIDYMOCARPUS RUGOSA, Ridley in Journ. Str. Br. R. As. Soc. No. 43,

45 (1905). *Stem* short, stout, woody, 2 to 3 in. long. *Leaves* crowded at the top, rather thick; oblong, oblanceolate, winged to the base; dentate; glabrous and strongly bullate, wrinkled above, beneath pubescent with midrib and nerves hairy; nerves very numerous and close (about 40 pairs), nervules transverse, strongly raised; 3 to 5 in. long, 1.5 to 2 in. wide. *Peduncles* slender, 3 in. long, hairy, ebracteate; flowers solitary. *Calyx*-lobes short, ovate acute. *Corolla*-tube trumpet-shaped, 1 in. long; lower lip longer than the upper; lobes broad, white with yellow central bar. *Stamens* 2; anthers narrow; connective 2-horned; staminodes short, very slender, hooked. *Ovary* and style very hairy; stigma broad, reniform.

PERAK: Hulu Selama, *Scortechini* 1273. KELANTAN: Kwala Lebir, *Dr. Gimlette*.

27. DIDYMOCARPUS PLATYPUS, Clarke in DC. Monog. Phan. V. i. 94 (1883), and in Hook. f. Fl. Br. Ind. IV. 352 (1884). *Stem* woody below, pubescent, leafy above, 4 to 22 in. long. *Leaves* sessile, alternate; oblanceolate, 8 to 13 in. long, 3 in. wide; margins serrate; above sprinkled with multicellular hairs from a swollen base, beneath glabrous except for the elevated nerves and reticulations, densely appressed hairy. *Peduncles* numerous, axillary, 1 in. long, slender, hairy; bracts 2, short, lanceolate, hairy; pedicel 1-flowered, .5 in. long, hairy. *Calyx*-lobes ovate, obtuse, hairy, .1 in. long. *Corolla* from a narrow base dilated forwards, 1.25 in. long, sparingly hairy, white with a yellow mouth; lobes broad, rounded. *Stamens* 2; filaments filiform, long; anthers reniform, with a process of the connective projecting beyond them. *Style* long, slender; stigma wide, discoid. *Capsule* cylindrical, 1.5 in. long, pubescent. Ridley in Journ. Linn. Soc. XXXII. 505, and in Journ. Str. Br. R. As. Soc. No. 43, 46.

PERAK: Gunong Batu Putih, *Wray* 934; Goping, *King's Collector* 832. SELANGOR: Klang, *Beccari* 5; Kuala Lumpur, *Ridley*. NEGRI SEMBILAN: Perhentian Tinggi, *Ridley* 10097; Bukit Temiang, *Cantley*. MALACCA: *Griffith* (K.D.) 3825; *Maingay* (K.D.) 1226; *Cuming* 2359; Ayer Panas, *Derry* 111; *Harvey*. JOHORE: Ulu Batu Pahat, *Kelsall*; Gunong Pulai, *Ridley* 3729. SINGAPORE: Bukit Timah, Selitar, *Ridley*.—DISTRIB. Sumatra.

28. DIDYMOCARPUS KOMPSOBÆA, Clarke in DC. Monog. Phan. V. i. 92, t. 10 (1883). *Stem* woody, 4 to 5 in. tall. *Leaves* crowded at the top; oblanceolate, acute, narrowed towards the base; 5 to 9 in. long, 2 to 3 in. wide; margins coarsely crenate-dentate; above glabrous when adult, with a few multicellular hairs when young; beneath minutely pubescent; nerves and reticulations elevated; midrib and main nerves with long brownish appressed hairs. *Peduncles* 1-flowered, 4 in. long,

hairy. *Calyx*-lobes ovate, hairy, .125 in. long. *Corolla* white with yellow in the throat; tube 1 in. long; base narrowed, above somewhat abruptly swollen, nearly glabrous; lower lip longer than the upper one. *Stamens* 2; filaments filiform; anthers oblong. *Capsule* 1.75 in. long, moderately thick, pubescent. Ridley in Journ. Str. Br. R. As. Soc. No. 43, 44.

PAHANG: Tahan River Woods, *Ridley* 2152. SELANGOR: Bukit Hitam, *Kelsall*.

29. DIDYMOCARPUS QUINQUEVULNERA, *Ridley* in Trans. Linn. Soc. Ser. 2, III. 328 (1893). *Stem* woody, 6 to 9 in. tall or less, covered with brown wool. *Leaves* lanceolate, acuminate, acute, serrate, narrowed to the base; silky pubescent, dark green; 6 in. long, 2 to 2.5 in. wide. *Peduncles* slender, rosy, white-ciliate; flowers numerous. *Calyx*-lobes lanceolate, acute. *Corolla*-tube slender, dilated forwards, 3 in. long, white, 2-lipped; lobes rounded, crimson or violet-purple edged with white, with yellow streaks in the throat. *Stamens* rather thick, sinuate, white; anthers reniform. *Ovary* cylindric, pubescent; stigma cordate. *Capsule* cylindric, acuminate, 3.5 in. long. *Ridley* in Journ. Str. Br. R. As. Soc. No. 43, 47.

PAHANG: Kota Glanggi, Tahan Woods, *Ridley* 2144, 2154. SELANGOR: Pahang Track, 15th mile, *Ridley* 8559.

30. DIDYMOCARPUS ATROSANGUINEA, *Ridley* in Trans. Linn. Soc. Ser. 2, III. 328 (1893). *Stem* woody, 6 in. high, .25 in. thick. *Leaves* lanceolate, acute, crenulate, denticulate or dentate, base broad; 9 in. long, 4 in. wide; deep green velvety pubescent above, glaucescent, pubescent beneath with elevated nerves and nervules. *Peduncles* 3 in. long, pubescent; bracts ovate. *Calyx*-lobes linear, acute, .25 in. long, pubescent, red. *Corolla* pubescent, deep red, yellow in the mouth; tube 2 in. long, dilated upwards; lobes subequal, ovate obtuse. *Stamens* 2; filaments sinuous, rather thick; anthers semi-ovate. *Style* longer than the stamens, pubescent; stigma rounded. *Ridley* in Journ. Str. Br. R. As. Soc. No. 43, 47.

PAHANG: Tahan Woods, *Ridley*. TRINGGANU: *Ridley*.

31. DIDYMOCARPUS HIRSUTA, *Ridley* in Journ. Str. Br. R. As. Soc. No. 43, 48 (1905). *Stem* woody, over 1 ft. long, branched, densely hairy above with long multicellular hairs. *Leaves* alternate, lanceolate acuminate, narrowed to the base, crenate, densely hairy on both surfaces; 6 in. long, 1.5 in. wide; petiole .5 in. long or less. *Flowers* solitary on the peduncles in the lower and upper axils. *Peduncles* very slender, hairy, 1 in. long. *Calyx*-lobes short, ovate lanceolate, obtuse. *Corolla* narrow, 1.5 in. long, yellow, pubescent. *Capsule* very narrow, cylindric, pubescent, 3 in. long.

PERAK: Goping, *King's Collector* 715; Larút Hills, *King's Collector* 2529.

32. DIDYMOCARPUS BOMBYCINA, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 32 (1905). *Stem* branched, woody, 3 to 4 ft. tall; above closely silky pubescent. *Leaves* lanceolate acuminate; 4 to 6 in. long, 1 in. across; narrowed to the base; minutely crenulate; densely silky pubescent on both sides; nerves very numerous and close. *Pedicels* short, 1 in. long, slender, silky. *Calyx*-lobes ovate, acute, small, silky. *Corolla*-tube 1 in. long, sparingly pubescent, white tinged with pink or blue, trumpet-shaped.

PERAK: Ulu Bubong, 400 to 600 ft., *King's Collector* 10587.

33. DIDYMOCARPUS CRINITA, Jack in Mal. Misc. I. II. 1 (1820), and in Trans. Linn. Soc. XIV. 33, t. 2, fig. 2 (1823). *Stem* woody, pubescent, 6 in. tall. *Leaves* narrow, lanceolate acute, narrowed to the base; shortly and closely serrate; 6 in. long, 1 in. wide; dark green above, sometimes with a white longitudinal bar, covered closely with short velvety hair; beneath purple with longer hair especially on the nerves. *Peduncles* about 1 in. long, villous; *pedicels* .25 in. long; bracts linear, all villous. *Calyx*-lobes narrow, lanceolate acute, villous, .125 in. long. *Corolla* white or usually pale blue, 1.5 in. long, pubescent; tube narrowed at the base, dilated forwards; lobes large, rounded, subequal. *Stamens*: filaments filiform, curved; anthers oblong with short lateral processes. *Style* and *ovary* cylindrical, pubescent; stigma discoid. *Capsule* slender, cylindrical, 2 to 3 in. long, pubescent. Calc. Journ. Nat. Hist. IV. 53, t. 15, fig. 2; Wall. Cat. 779; Spreng. Syst. II. 837; G. Don Gen. Syst. Dichl. Pl. IV. 659; R. Br. in Benn. Pl. Jav. Rar. 118, and in Ann. Sc. Nat. 2, XIII. 164; DC. Prodr. IX. 265; Hook. Bot. Mag. t. 4554; Fl. des Serres, t. 631; Lem. Jard. Fl. t. 87; Miq. Fl. Ind. Bat. II. 724; Clarke in DC. Monog. Phan. V. i. 93, and in Hook. f. Fl. Br. Ind. IV. 351; Ridley in Journ. Linn. Soc. XXXII. 505, and in Journ. Str. Br. R. As. Soc. No. 43, 49. *Henckelia crinita*, Spreng. Syst. curæ post. 13.

KEDAH: Gunong Jerai, *Ridley*; Tomoh, *Machado*. KELANTAN: Kwala Lebir, *Dr. Gimlette*. PENANG: *Wallich*; *Helper* 3834; *Gaudichaud* 71; West Hill, *Curtis* 410; *Stoliczka*; *G. King*; *Deschamps*. PERAK: Larút Hills, *Scortechini* 10294; *Ridley* 2907; *King's Collector* 2157; Tapa, *Curtis* 3781. SELANGOR: Ginting Bidai, *Ridley* 7577. SUNGAI UJONG: Bukit Sulu, *Cantley*. PAHANG: Raub Track, *Machado* 11575; Tahan Woods, *Ridley* 2169. MALACCA: *Maingay* (K.D.) 1225; *Harvey*. SINGAPORE: *Walker* 18; *Lobb* 311. — *DISTRIB.* Sumatra, Borneo.

VAR. *Curtisii*, *Ridley*. *Leaves* oblanceolate, acute, serrate, deep green

with a silvery central bar, covered with long multicellular hairs from a swollen base on both sides, very dense and longer on the back at the base and on the buds. *Scapes* 3 in. long, hairy, slender. *Calyx*-lobes oblong, hairy, blunt. *Corolla* 2 in. long, blue; tube hairy, swollen upwards; lobes unequal, 1 in. across the limb. *Stigma* broad, heart-shaped.

SELANGOR: near the Gap, *Curtis*.

VAR. *elongata*, Ridley. *Stem* tall and somewhat branched. *Leaves* scattered, narrow and small; 3 in. long, .5 in. wide, hairy. *Flowers* small, pale blue, 1 in. long, on slender pedicels 3 in. long or less, from the lower as well as from the upper axils.

PERAK: Tapah, *Curtis* 3781.

34. DIDYMOCARPUS FASCIATA, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 50 (1905). *Stem* woody, 6 to 8 in. tall, with soft hair in the upper parts. *Leaves* alternate, narrowly lanceolate, acuminate, narrowed to base; 4 to 8 in. long, 1.5 in. wide; margins serrulate crenulate; above deep velvety malachite green, with a broad central white bar covered with short scattered hairs; back, edges, and petiole with longer pale silky hairs. *Peduncles* slender, short, 1.5 in. long, hairy; bract very small, linear. *Calyx*-lobes narrow, lanceolate, very small. *Corolla* 1.5 in. long, cylindric, trumpet-shaped; white limb edged violet. *Capsule* very slender, 2 in. long or less, glabrous.

KEDAH: Gunong Jerai, *Ridley*. PAHANG: Tahan River, in rocky woods, *Ridley* 2169.—DISTRIB. Lingga, Batu Gajah (*Hullett*).

35. DIDYMOCARPUS VENUSTA, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 51 (1905). *Stem* erect, woody, 12 to 18 in. tall. *Leaves* oblong lanceolate, subacute, crenulate-serrate, narrowed into the petiole, winged to the base; 4 to 6 in. long, 1 to 2 in. wide; nerves elevated on both surfaces, 22 pairs; glabrous above, nerves and midrib ferruginous hairy beneath. *Peduncles* axillary, 1 or 2 in. in an axil, 7 in. long, hairy; flowers terminal, 2, large, white; bracts 2, oblong cuspidate, glabrous, .3 to .4 in. long; pedicels hairy, lower one .25, upper one .5 in. long. *Calyx*-lobes free to base, linear acuminate, pubescent, .5 in. long. *Corolla* pubescent; tube enlarged upwards, infundibuliform, 1.5 in. long, pure white with a brown spot on the lower lobes; upper lobes shorter than lower, rounded; lower lip .5 in. long, lobes oblong. *Stamens* included, 2; filaments filiform; anthers oblong; staminodes filiform, hooked. *Ovary* narrow, cylindric, with style .5 in. long; all pubescent; stigma large, cordate. *Capsule* terete, acuminate, splitting along the upper edge, glabrous, 2 to 2.5 in. long.

PERAK: Bujong Malacca, *Ridley*. SELANGOR: Gunong Semangko, *Curtis* 3751.

Ridley says this beautiful plant hardly belongs to this group. It resembles much more closely a *Didissandra*, but has 2 stamens only.

Sect. V. SALICINÆ.

36. DIDYMOCARPUS DENSIFOLIA, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 51 (1905). *Stem* woody, 3 in. tall. *Leaves* numerous, crowded, alternate; lanceolate, acuminate, narrowed to the base, rather thick in texture, entire, nearly glabrous when adult except for a few hairs on the midrib; 1·5 to 5 in. long, ·25 to ·75 in. wide. *Peduncles* hairy, slender, 3 in. long, with a few 1-flowered short branches; bracts linear, oblong. *Calyx*-lobes linear oblong, pubescent. *Corolla* not seen. *Ovary* cylindric, pubescent; style pubescent; stigma small, capitate. *Capsule* cylindric, pubescent, 1 in. long, splitting nearly to the tip.

JOHORE: Gunong Janeng, *Kelsall*.

37. DIDYMOCARPUS SALICINA, Ridley in Trans. Linn. Soc. Ser. 2, III. 329 (1893). A small shrubby plant, 3 to 6 in. tall, simple or branched, glabrous below, pubescent above. *Leaves* numerous, crowded above, opposite; narrowly lanceolate, acuminate, glabrous, serrate; 3 to 4 in. long, 1·5 in. wide; pale green above, reddish beneath; petiole slender, 1·5 in. long or less. *Peduncles* numerous, crowded in the upper axils, very slender, glabrous, red, 2 in. long; branches few, divaricate, pubescent; flowers very small, ·125 in. long, pink. *Calyx*-lobes very narrow, linear-pubescent. *Corolla* campanulate; lobes ovate acute. *Stamens* 2; filaments short, slender; anthers reniform. *Style* longer than the corolla, glabrous; stigma small, capitate. *Capsule* cylindric, acuminate, ·75 in. long. Ridley in Journ. Str. Br. R. As. Soc. No. 43, 52.

PAHANG: Tahan River, *Ridley* 2166. On stream-banks in woods.

38. DIDYMOCARPUS SERRATIFOLIA, Ridley. *Stem* woody, 6 in. long or less. *Leaves* numerous, lanceolate acute, narrowed at base, not petioled; strongly toothed; teeth ·125 in. long, acute; nerves 40 pairs; 8 in. long, 1 in. wide; glabrous above, midrib with pale hairs beneath. *Scape* slender, hairy, 3 in. long; flowers 4 or 5, nearly sessile. *Calyx*-lobes ovate, short hairy. *Corolla* trumpet-shaped, ·75 in. long, narrowed at base, dilated upwards; lower lip longer than upper one; ·25 in. wide, 3-lobed, side lobes rounded, median longer, oblong; white stained with purple outside, yellow in the mouth. *Capsule* very slender, over 1 in. long, pubescent, pedicelled. *D. serrata*, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 52, *not of* R. Br.

PERAK: Larut Hills on rocks in dense forest, below the Tea Gardens, at about 1000 ft. alt., *Ridley* 11922.

39. *DIDYMOCARPUS PECTINATA*, Clarke in Herb. Kew., ex Oliver in Ic. Pl. t. 2246 (1892). Small shrubby plant, 6 in. or more tall, branched or simple. *Leaves* densely crowded at the top, glabrous, deeply pectinate, 6 to 7 in. long; lobes .4 in. long, .125 in. wide at the base, blunt. *Peduncles* from the upper axils several, pubescent, 2 in. long. *Calyx* "dark blue." *Corolla* white, tomentose, .3 in. long; tube cylindric, slightly inflated; upper lobe obovate, rounded. *Stamens* 2; filaments curved; anthers oblong; staminodes absent. *Disk* tubular. *Capsule* .5 to .75 in. long, pale, glabrous, rather thick, curved. Ridley in Journ. Str. Br. R. As. Soc. No. 43, 53.

PERAK: on limestone rocks at 400 to 800 ft. alt., *King's Collector* 10711. SELANGOR: Rawang, *Ridley* 7579; *Kelsall* 1981.

Sect. VI. ACAULES.

40. *DIDYMOCARPUS VIOLACEA*, Ridley in Journ. Linn. Soc. XXXII. 509 (1895). *Rootstock* short, erect; stem 1 in. long, densely woolly. *Leaves* numerous, very unequal, ovate to lanceolate, acute, narrowed at the base, oblique, toothed; densely softly hairy; 2 to 8 in. long, 1.25 to 2.5 in. wide; sessile or petioled; petiole as much as 2 in. long. *Panicles* 2 to 5 in. long, lax; branches slender, pubescent. *Calyx*-lobes oblong, lanceolate, .125 in. long, glabrous. *Corolla*-tube trumpet-shaped, curved, .5 in. long, violet; upper lobes short, recurved, lower ones .25 in. longer. *Stamens* 2; filaments filiform. *Ovary* long, terete; style short; stigma clubbed. *Capsule* glabrous, cylindric, .75 in. long.

PERAK: Hermitage Hill at 5000 ft. elevation, on rocks in the stream, *Ridley* 2909.

41. *DIDYMOCARPUS LACUNOSA*, Hook. f. Bot. Mag. t. 7236 (1892). Stemless. *Leaves* crowded, oblong or ovate, cordate, tomentose, crenulate, 2 to 4 in. long, 1.5 to 3 in. across; above pubescent, beneath rusty tomentose, especially on the elevated nerves; petiole 2 to 4 in. long, rusty tomentose. *Scapes* 4 to 6 in. long, 2- to many-flowered, simple or 3- or 4-branched at the top; branches .5 in. long; flowers nodding. *Corolla* 1 in. long, deep violet blue; tube narrow at the base, gibbous, inflated upwards; lobes short, rounded, subequal. *Stamens* included, curved, swollen near the base, narrowed upwards; anthers elliptic, not horned; staminodes filiform, one-third as long. *Pistil* linear, pubescent, gradually narrowed into the style; stigma very shortly bifid. *Capsule* 2 in. long, linear. Ridley in Journ. Str. Br. R. As. Soc. No. 43, 54.

KEDAH: Lankawi island, at Terutau, on damp rocks, *Curtis* 1655.

42. *DIDYMOCARPUS PERDITA*, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 54 (1905). *Stem* creeping, woody, about 4 in. long. *Leaves* elliptic obtuse, rounded, peltate; margins crenulate; 3 in. long, 1.5 in. wide; above scabrid and sprinkled over with hairs, beneath glabrous except for the midrib and nerves, which are hairy with appressed hairs; margin with hairs on the crenulations; petiole 1 to 2 in. long, hairy. *Peduncles* slender, 4 in. long, subterminal, hairy. *Calyx*-lobes lanceolate, pubescent. *Corolla* not seen. *Capsule* .5 in. long, narrowed suddenly into the style and only splitting as far as the base of the style; stigma subbilobed, large.

SINGAPORE: Selitar, very rare, *Ridley*.

Ridley found two plants of this together in a small ravine near Selitar in 1889, one in fruit. Since then the locality has been destroyed by cultivation, and the plant has disappeared and is probably extinct.

43. *DIDYMOCARPUS PUNCTICULATA*, Ridley in Journ. Linn. Soc. XXXII. 510 (1895). Almost stemless. *Leaves* crowded, elliptic or obcuneate or nearly oblanceolate, inæquilateral, base truncate; crenate, puncticulate, hispid; 3 in. long, 1.5 in. wide or smaller; nerves beneath elevated, hairy. *Peduncles* subterminal, 3 in. long, slender, thickening in fruit, hairy. *Calyx*-lobes lanceolate, acute, .06 in. long, hairy. *Corolla* .25 in. long, hairy, violet; tube short, broad campanulate; lower lip longer than the upper one; lobes oblong obtuse. *Stamens* very short; filaments thick; anthers large, conic, shield-shaped; style longer, pubescent. *Capsule* .5 in. long, thick, hispid.

JOHORE: Gunong Panti, *Ridley*.

44. *DIDYMOCARPUS HETEROPHYLLA*, Ridley in Trans. Linn. Soc. Ser. 2, III., 329 (1893). *Stem* short with a long woody root, woolly above. *Leaves* crowded, very variable in size, obovate, oblique or lanceolate, crenulate, obtuse; 4 in. long, 1.5 in. wide or less; above dark green, purplish in the centre, glabrous, beneath reddish; nerves raised, covered with red wool on the back. *Peduncles* slender, hairy, 3 in. long; branches short and few; flowers few, small. *Calyx*-lobes linear, pubescent, .125 in. long. *Corolla* campanulate, .25 in. long, violet, pubescent. *Style* longer, pubescent. *Capsule* cylindrical, curved, acuminate, 1 in. long, glabrous, splitting for nearly the whole length. Ridley in Journ. Str. Br. R. As. Soc. No. 43, 56.

PAHANG: Tahan River, *Ridley* 2170. JOHORE: Gunong Janeng, *Kelsall*.

45. *DIDYMOCARPUS PUMILA*, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 56 (1905). *Stem* slender, woody, 1 to 3 in. long. *Leaves* crowded at the top, elliptic obovate, obtuse, narrowed at the base and

inæquilateral; .5 to 1.5 in. long, .25 to 1 in. wide; above silky pubescent, beneath dotted with swollen hair-bases; nerves about 6 pairs, elevated, hairy with appressed hairs. *Peduncles* slender, erect, purple, with silky appressed white hairs, 2 to 3 in. tall, subterminal; flowers 1 to 2, terminal, very shortly pedicelled; bract linear, purple. *Calyx*-lobes linear, purple, pubescent. *Corolla* .25 in. long, with a short broad tube, pubescent, purplish-white, hardly bilabiate; lobes rounded, pinkish white. *Stamens* 2; filaments slender, short, filiform. *Ovary* slender, cylindric; style longer than stamens; stigma discoid. *Capsule* .75 in. long, terete, upcurved, splitting along the upper edge, minutely pubescent.

SELANGOR: the Gap—Semangko Pass, alt. 3000 ft., *Curtis* 3782; *Burn-Murdoch*.

AFFINITY DOUBTFUL.

46. DIDYMOCARPUS LILACINA, Ridley in Trans. Linn. Soc. Ser. 2, III. 330 (1893). *Stem* 12 to 15 in. long, entirely leafy, brown-pubescent. *Leaves* alternate, spreading, lanceolate, crenate dentate, pubescent, dark green; 4 in. long, 1 in. wide; petiole 1 in. long. *Pedicels* numerous, rising from the petiole near the leaf-blade, slender, .25 in. long, pubescent. *Calyx*-lobes very short, lanceolate, hispid. *Corolla* campanulate, rosy-violet, sparingly pubescent; lobes oblong, rounded. *Stamens* 2; filaments thick, with slender base; anthers reniform. *Style* shorter than the corolla, pubescent; stigma capitate. *Capsule* .65 in. long, rather thick, cylindric, with a short beak. Ridley in Journ. Str. Br. R. As. Soc. No. 43, 57.

PAHANG: Tahan River, *Ridley* 2165.

5. CHIRITA, Buch.—Ham.

Herbs or slender shrubs. *Leaves* opposite, often unequal or whorled or alternate; elliptic or ovate. *Peduncles* axillary, 1- or more flowered; bracts free or connate, small or large. *Calyx* 5-lobed, with acute lobes, usually large. *Corolla* infundibuliform or tubular-ventricose, blue or white, 2-lipped; lobes rounded. *Stamens* 2; filaments filiform, geniculate; anthers rounded, connivent, often hairy. *Disk* annular. *Ovary* cylindric, linear; style usually long; stigma ovate or narrow, bifid. *Capsule* long, cylindric.—DISTRIB. Species about 26, in India, China, and Malaya.

Bracts free:—

Stems 2 ft. high; leaves ovate; corolla 1 in. long, claret-coloured

Stems under 2 ft. high; corolla blue or violet, rarely white:—

.. .. . 1. *C. elata*.

Leaves ovate :—

Corolla 1·5 in. long, azure blue; stems 1 ft. high or more .. 2. *C. caliginosa*.

Corolla ·75 in. long, violet with darker streaks; stems
under 1 ft. high 3. *C. viola*.

Leaves lanceolate; corolla blue, rarely white .. 4. *C. sericea*.

Bracts connate; leaves ovate; corolla blue or violet :—

Corolla-tube ·5 in. long 5. *C. rupestris*.

Corolla-tube 1 in. long 6. *C. Glasgovii*.

DOUBTFUL SPECIES.

7. *C. mollissima*.

1. *CHIRITA ELATA*, Ridley in Journ. Linn. Soc. XXXII. 518 (1895). A tall rough herb, 2 ft. high. *Stem* angled, branched. *Leaves* 3 to 6 in. long, 1·5 to 3 in. wide, ovate, inæquilateral, acute, toothed; with elevated nerves, hispid; petioles slender, 1 in. long. Cymes lateral, axillary, 3 in. long, hispid. *Calyx*-lobes lanceolate acuminate, hairy, ·125 in. long. *Corolla* funnel-shaped, hairy, 1 in. long, claret colour; lobes short, rounded, subequal, ·5 in. across. *Stamens* 2; filaments slender; anthers oblong; staminodes short, with abortive anthers. *Ovary* short, pubescent; stigma peltate, sub-bilobed. *Capsule* straight, cylindrical. Ridley in Journ. Str. Br. R. As. Soc. No. 43, 57.

PERAK: Larút Hills, *Wray* 2985; *Curtis* 2038; *Ridley* 2911.

2. *CHIRITA CALIGINOSA*, Clarke in DC. Monog. Phan. V. i. 122 (1883). A soft herb, 1 ft. or more tall, often branched. *Leaves* opposite; ovate acuminate, base broad or cuneate, very inæquilateral; margins entire or slightly toothed; 2·5 in. long, 1 to 2 in. wide; closely pubescent; petiole ·5 in. long. *Flowers* several, axillary; pedicels ·5 to 1 in. long, pubescent. *Calyx*-lobes lanceolate acuminate, hairy, 5 in. long. *Corolla* 1·5 in. long, azure blue; tube narrow at the base, broadly infundibuliform at the apex, pubescent; lobes large, rounded, ·75 in. across the lips. *Stamens* 2; anthers globose, covered with long hairs at base. *Style* slender, pubescent; stigma bilobed, lobes linear. *Capsule* 3 in. long, slender, cylindrical, curved. Clarke in Hook. f. Fl. Br. Ind. IV. 360; Ridley in Journ. Linn. Soc. XXXII. 516, and in Journ. Str. Br. R. As. Soc. No. 43, 58.

PERAK: Kuala Dipang, *Curtis* 3109; Batu Kuran, *Scortechini* 1582

SELANGOR: Kuala Lumpur caves, *Beccari*; *Curtis* 2359.

3. *CHIRITA VIOLA*, Ridley in Journ. Linn. Soc. XXXII. 516 (1895). A herb, 2 to 10 in. tall, pubescent. *Leaves* ovate acute, crenate or serrate or entire, very unequal, 2 to 6 in. long, 1·5 to 3 in. wide; petiole ·125 in. long. Cymes short, few-flowered; flowers small; pedicels ·5 in. long. *Calyx*-lobes lanceolate, acute, hispid, nearly ·125 in. long. *Corolla* ·75 in. long, violet; tube narrow at the base, thin, dilated,

trumpet-shaped; upper lobes short, rounded, lower ones ovate obtuse, longer, median one longest, elliptic, all violet with darker streaks and a patch of yellow glandular hairs in the mouth. *Stamens* 2, exsert; anthers yellow, ovoid, with a thickened connective, ciliate at the base, with a black spot on each anther; filaments attached to the mouth of the tube. *Ovary* pubescent; stigma obliquely bifid; lobes linear, obtuse. *Capsule* terete, acute, 1.5 in. long, minutely pubescent. Ridley in Journ. Str. Br. R. As. Soc. No. 43, 59.

KEDAH: Lankawi Islands, *Curtis* 2570.—DISTRIB. S. Siam, on limestone rocks.

4. *CHIRITA SERICEA*, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 59 (1905). Herb, 3 to 6 in. tall, simple or branched, woolly. *Leaves* alternate, lanceolate, acute or acuminate, base unequal, cuneate; 2 to 3 in. long, .5 in. wide; margins entire; both sides densely covered with short silky hairs; petiole .25 to 1 in. long. *Flowers* 1 to 2, axillary; pedicels .5 in. or less, silky-hairy, ebracteolate. *Calyx*-lobes narrow, linear acuminate, densely silky-hairy. *Corolla* blue, rarely white; tube half as long again as sepals; lobes broader, unequal, oblong, all hairy. *Style* slender, glabrous; stigma bilobed, lobes elliptic. *Capsule* cylindrical, 1.5 in. long, silky-hairy.

PERAK: Ipoh, limestone rocks, *Curtis* 3131.

VAR. *Scortechinii*, Ridley, *l.c.*

Capsule shorter, .5 in. long, and thicker, .125 in. through, splitting longitudinally into 2 valves. *Corolla*-tube straight; lobes of lower lip broad.

PERAK: *Scortechinii* 102, 112.

5. *CHIRITA RUPESTRIS*, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 59 (1905). A herb, about 4 to 10 in. tall. *Stem* simple or branched, glabrescent. *Leaves* opposite or alternate, thin, ovate obtuse; 1 to 3 in. long, .5 to 2.5 in. wide; above sprinkled with multicellular hairs. *Flowers* axillary, 1 to 2, sessile, on a peduncle .5 in. long, hairy, enclosed in a green cupular bilobed bract .5 in. long; edges recurved and covered with multicellular hairs. *Calyx*-lobes narrowly lanceolate, hairy, nearly .5 in. long. *Corolla*-tube as long as the bract, hairy, blue, little longer than the calyx-lobes, rounded. *Ovary* and style slender, hairy. *Capsule* cylindrical, slender, curved, 2.5 in. long.

KEDAH: Lankawi, on damp rocks, *Curtis* 2120.

6. *CHIRITA GLASGOVII*, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 60 (1905). A weak herb, 1 ft. tall, branched. *Leaves* ovate obtuse, thin; 1 to 3 in. long, .75 to 2 in. wide; base rounded, retuse; nerves 5 pairs, alternate; above sprinkled with multicellular hairs, beneath paler with a few hairs on the nerves, otherwise nearly glabrous; petiole

slender, 1 to 2 in. long, glabrous. *Bract* convolute, bilobed; lobes ovate, hairy, 1 in. long. *Calyx*-lobes lanceolate acuminate, narrow, hairy, .5 in. long. *Corolla*-tube 1 in. long, minutely hairy, dark violet. *Capsule* cylindric, curved, 3 in. long, glabrous.

PERAK: Waterloo near Kuala Kangsa, *C. Robertson-Glasgow*.

DOUBTFUL SPECIES.

7. *CHIRITA MOLLISSIMA*, Ridley in Journ. Linn. Soc. XXXII. 517 (1895). Nearly stemless. *Leaves* congested, lanceolate, acute, obscurely minutely serrate, silvery-tomentose; 6 to 8 in. long, 1.25 to 2 in. broad. *Flowers* pedicelled, drooping, axillary, few, handsome; pedicels somewhat thick, woolly; 1 in. long. *Calyx*-lobes lanceolate, acuminate, equal, .5 in. long, tomentose. *Corolla* funnel-shaped, more than 1 in. long, oblong, obtuse; the upper lobes short, rounded, violet, the lower wider; the tube white in the throat, with glandular hairs above the anthers. *Stamens* 2; filaments broad, curved; anthers broad, thick. *Pistil* pubescent, emerald green, little exsert; the ovary cylindric, attenuated in the style; stigma 2-lobed, pubescent, decurved. *Capsule* 1 in. long, broad, thick, glabrous or pubescent.

SIAMESE STATES: Pangah, *Curtis* 2944.

6. *TETRAPHYLLUM*, Griff.

Undershrubs; stem elongate, with leaves crowded towards the apex. *Leaves* opposite or in whorls of 4, nearly sessile, ovate, unequal-sided. *Cymes* capitate or lax from the axils of the upper leaves; bracts elliptic, oblong or lanceolate. *Calyx* somewhat large, 5-partite, obscurely 2-lipped. *Corolla* widely funnel-shaped, more or less 2-lipped; lobes 5, subequal, ovate. *Stamens* 2, fertile; filaments short, filiform, often spirally twisted; anthers 2-celled; apex submucronate; cells oblong or ellipsoid, parallel or divergent; staminodes very minute. *Ovary* ellipsoid, acute; style linear; stigma small, capitate, sub-bilobed; placenta parietal, 2-lamellate; ovules very numerous. *Capsule* ovate or lanceolate, dehiscing both loculicidally and septucidally; having 2 ribs united at the tip and the placenta split into 2 lamellae. *Seeds* very minute, ellipsoid; testa reticulate.—*DISTRIB.* 2 species, one Indian, the other of the Malay Peninsula.

TETRAPHYLLUM ROSEUM, Stapf ex Ridley in Journ. Linn. Soc. XXXII. 524 (1895). *Leaves* opposite, closely approximate, the end ones subverticillate, usually in fours; elliptic or obovate-elliptic, obtuse at apex, narrowed at base; crenate-denticulate; above green, shining, bullate, pilose; beneath pale, punctulate, pilose on the nerves; 2.5 to 3.5 in. long, 1.75 to 2.25 in. broad; petiole .15 to .2 in. long.

Cymes few-flowered, from the axils of the last 3 or 4 leaves, collected in a terminal inflorescence 1 in. long; bracts oblong or lanceolate; pedicels slender, about .2 in. long. *Calyx* deeply 5-fid, scarcely .5 in. long; lobes ovate acute; tube obscurely 5-angled, glabrous. *Corolla* glabrous; tube nearly .5 in. long, white, curved; limb pink, bilabiate, upper lip erect, 2-lobed, lower lip 3-lobed, lobes rounded. *Stamens* included; filaments filiform, spirally twisted, glabrous; anthers adhering at the apex, with a thick connective; cells oblong, divergent at base. *Ovary* oblong, puberulous; style as long as ovary; stigma capitate, sub-bilobed; placenta 2-lamellate; the lamellæ densely ovule-bearing. *Capsule* ovate-oblong, .3 to .5 in. long, as long as the persistent calyx.

SIAMESE STATES: Pungah, *Curtis*.

7. LOXOCARPUS, Br.

Herbs, scapigerous. *Leaves* ovate or oblong, petiolate, pubescent. *Flowers* 1 or more in a peduncled cyme, blue. *Calyx*-lobes 5, free to base or nearly so. *Corolla* campanulate, small, hardly bilabiate; lobes rounded. *Stamens* 2; filaments short, thick, sinuate; anthers reniform, large. *Ovary* oblong; style longer than stamens; stigma capitate. *Capsule* follicular, conic, dehiscing along the upper edge.—DISTRIB. Species 7, of the Malay Peninsula and Borneo.

Flowers 1 or 2 on slender silky scapes 2 to 2.5 in. long . . . 1. *L. semitorta*.

Flowers few or numerous on dichotomously branched viscidly hairy peduncles:—

Peduncles 2 to 4 in. long; flowers few or numerous; capsule

ovoid 2. *L. incana*.

Peduncles 6 to 12 in. long; flowers numerous; capsule cornicu-

late 3. *L. cœrulea*.

1. LOXOCARPUS SEMITORTA, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 61 (1905). Stemless. *Leaves* numerous; ovate or oblong, obtuse, rather thick, base broad; .3 to 1 in. long, .25 to .75 in. wide; above green silky, beneath with thick red-woolly raised nerves; petiole 1 to 2.5 in. long, thick, red-woolly. *Scapes* slender, 2 to 2.5 in. long, silky; flowers 1 or 2. *Calyx*-lobes lanceolate, hairy, .125 in. long. *Corolla* .5 in. long; tube broad, oblique, pale blue with violet streaks in the throat; lobes very short and indistinctly marked. *Stamens*: filaments short, curved; anthers reniform, purple. *Ovary* and style hairy, shorter than corolla, larger than stamens. *Capsule* .25 in. long, horn-shaped, acuminate with the persistent style; base swollen. *Didymocarpus semitorta*, Clarke in DC. Monog. Phan V. i. 99, and in Hook. f. Fl. Br. Ind. IV. 352.

MALACCA: Mount Ophir, *Griffith* (K.D.) 3836; *Maingay* (K.D.) 1220; *Ridley* 3184, and all collectors. On rocks in the stream. "The Mount Ophir Violet."

2. *LOXOCARPUS INCANA*, R. Br. in *Benn. Pl. Jav. Rar.* 115, 120 (1840), and *Ann. Nat. Sci.* XIII. 2, 167. Stemless. *Leaves* ovate, cordate, serrulate, subacute, silky-tomentose above and beneath; 1 to 3 in. long, .75 to 1.5 in. wide; petiole .75 to 1 in. long. *Peduncles* 2 to 4 in. long, above dichotomously branched, viscid-hairy; flowers few or numerous. *Calyx*-lobes lanceolate, pubescent, hairy, white tinted green. *Corolla*-tube straight, thick; upper lobes oblong, recurved, lower lobes oblong, blue. *Filaments* straight. *Pistil* conic; style stout; stigma capitate. *Capsule* ovoid; tip upcurved, hairy. *Miq. Fl. Ind. Bat.* II. 737. *L. alata*, A. DC. *Prodr.* IX. 277. *Didymocarpus incana*, Benth. and Hook. f. *Gen. Pl.* II. 1022; Clarke in DC. *Monog. Phan.* V. 98, and in Hook. f. *Fl. Br. Ind.* IV. 352; *Ridley* in *Journ. Linn. Soc.* XXXII. 5121, and in *Journ. Str. Br. R. As. Soc.* No. 43, 62. *Loxonia? alata*, Wall. *Cat.* 809.

PENANG: Government Hill, Waterfall, *Curtis* 297; *Maingay* (K.D.) 1228; *Wallich* 809. PERAK: Hermitage Hill, *Ridley*; Bujong Malacca, *Ridley* 9782. SELANGOR: Bukit Kutu, *Ridley*.

3. *LOXOCARPUS CÆRULEA*, *Ridley* in *Journ. Str. Br. R. As. Soc.* No. 43, 62 (1905). Stemless or nearly so. *Leaves* several; ovate; base cordate; serrate, inæquilateral; 2 to 6 in. long, 1.5 to 4 in. wide; silky-hairy above, tomentose beneath; petiole 2 to 8 in. long, pubescent. *Peduncles* 6 to 12 in. tall, viscid-hairy; cymes compact or branched with 2 or 3 branches 2 in. long; flowers numerous; bracts lanceolate, narrow. *Calyx*-lobes lanceolate, narrow, shorter than the tube. *Corolla* pubescent, 2-lipped, .4 in. long and wide; tube short, broad, campanulate; upper lobes oblong obtuse, lower ones truncate, median one longer, blue with a violet mouth. *Stamens* exsert; filaments suddenly thickened in the middle, sigmoid; anthers connate, deep violet. *Style* slender. *Capsule* .4 to .5 in. long, lanceolate acute, horn-shaped, upcurved, viscid. *Didymocarpus cærulea*, *Ridley* in *Journ. Linn. Soc.* XXXII. 513.

PERAK: Larút Hills, at 5000 ft. alt., *Ridley*; *King's Collector* 6990; *Scortechini* 1427; Gunong Bubú, *Wray* 3809. SELANGOR: Bukit Hitam, *Kelsall*.

8. PARABŒA, *Ridley*.

Herbaceous plants or with a shrubby stem. *Leaves* usually in a rosette, tomentose or hairy. *Flowers* small, white or pink, in simple or paniced cymes; peduncle usually long. *Calyx* small. *Corolla* white

explanate, campanulate, with a very short tube, distinctly 2-lipped or nearly regular; lobes equal, oblong or unequal, blunt. *Stamens* 2, fertile; filaments thick, short; anthers large, 2-celled, connivent by the tips. *Disk* none. *Ovary* sessile; style longer than the stamens, stout; stigma small, capitate. *Capsule* straight, narrow, slender, not twisted, splitting longitudinally. **DISTRIB.**—Species about 20. Siam-Malaya.

Corolla-tube, campanulate:—Sect. I. **CAMPANULATÆ**:—

Corolla .5 in. long:—

Flowers many in large spreading panicles; leaves sparingly hispid, opposite 1. *P. cordata*.

Flowers solitary or few on slender peduncles:—

Peduncles subterminal; leaves opposite, ovate:—

Leaves hairy on margins and on midrib and nerves beneath; peduncles 1-flowered 2. *P. campanulata*.

Leaves quite glabrous; peduncles branched dichotomously, branches 1-flowered 3. *P. Scortechinii*.

Peduncles axillary; leaves crowded at apex of stem, lanceolate 4. *P. cœrulea*.

Corolla under .5 in. long; flowers few, crowded 5. *P. pyroliflora*.

Corolla-tube not campanulate, very short:—Sect. II. **BREVIFLORÆ**:—

Corolla-lobes equal or subequal, if slightly 2-labiate the lower lip hardly longer than the upper:—

Flowers in compact umbels or cymes on pedicels .5 in.

long or less at the apex of the peduncles:—

Leaves not purple beneath, in a basal rosette; stem 0:—

Flowers umbellate, pedicels .5 in. long; leaves ochre-yellow beneath 6. *P. capitata*.

Flowers in compact scorpioid cymes; leaves pale beneath 7. *P. ferruginea*.

Leaves purple beneath, crowded at the apex of a short stem; flowers umbellate, pedicels .25 in. long 8. *P. regularis*.

Flowers at the apex of slender cyme-branches 1 to 3 in. long:—

Leaves ochreous-tomentose beneath in a basal rosette; stem 0 9. *P. polita*.

Leaves red-woolly beneath; stem 2 in. long 10. *P. vulpina*.

Corolla lobes distinctly unequal, these of lower lip longer than those of upper:—

Calyx-lobes lanceolate; leaves obovate, coarsely toothed, dull green; corolla .25 in. across 11. *P. laxa*.

Calyx-lobes oblong or linear oblong obtuse:—

Leaves oblong-elliptic, sparsely hairy; corolla .5 in. across 12. *P. Curtisii*.

Leaves obovate, arachnoid on both sides, yellowish beneath; corolla .25 in. across 13. *P. obovata*.

1. *PARABÆA CORDATA*, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 64 (1905). A tall herb, 2 ft. high; stem pubescent. *Leaves* opposite, ovate acuminate, inæquilateral at base, dentate, sparingly hispid above and beneath; nerves 10 pairs, hairy beneath; 6 to 7 in. long, 4 in. wide; petiole 1 in. long. *Peduncles* stout, 6 to 8 in. long, pubescent, bearing a spreading panicle 4 to 6 in. long; bracts in pairs at the base of each bifurcation, ovate, glabrous, .125 in. long; pedicels slender, .5 in. long, glabrous. *Calyx*-lobes lanceolate, free to base, glabrous, .5 in. long. *Corolla* campanulate, .5 in. long, white tinted violet; lobes short, equal, rounded, with 2 rows of glands on each. *Stamens* 2; filaments short; anthers subglobose, large; staminodes minute. *Ovary* slender, glabrous. *Capsule* sausage-shaped, 4-angled, 1.5 in. long, glabrous, rather thick, splitting on two sides. *Seeds* minute, deep red, oblong. *Didymocarpus cordata*, Jack; R. Br. Benn. Pl. Jav. Rar. 119; Ann. Sc. Nat. 2, XIII. 164; Wall. Cat. 781; DC. Prodr. IX. 265; Miq. Fl. Ind. Bat. II. 726; Clarke in DC. Monog. Phan. V. 84, t. 9, and in Hook. f. Fl. Br. Ind. IV. 350; Ridley in Journ. Linn. Soc. XXXII. 514.

PENANG: Wallich 781; Maingay (K.D.) 1224; W. Fox; Curtis 452. PERAK: Larut Hills, Scortechini 296, 400; Ridley 2913, 10682; King's Collector 2227, 2331, 6378. Common on rocks at 2000 to 6000 ft. alt.

VAR. *debilis*, Ridley. Rhizome fleshy; stem 6 in. tall, pubescent. *Leaves* thin, ovate oblique; base obtuse; apex acute or subacute; margin crenate dentate; sparingly hispid, 1.5 to 4 in. long, 1 to 2 in. long. *Panicle* 4 to 6 in. long, glabrous, weak, few-branched; branches short and thin; bracts ovate; flowers smaller.

KEDAH: Gunong Jerai, Ridley.

VAR. *ophirensis*, Ridley.

Tall and weak. *Leaves* thin, lanceolate, subacute or acute, narrowed at the base; 6 in. long, 2 in. wide. *Panicle* weak, glabrous; bracts lanceolate; flowers smaller, white. *Capsule* smaller, curved, .4 in. long.

MALACCA: Mount Ophir, on a big cliff in the forest below Padang Batu, Ridley 3183.

2. *PARABÆA CAMPANULATA*, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 65 (1905). *Stem* slender, herbaceous, 1 ft. tall, shortly hairy. *Leaves* opposite, in distant pairs, elliptic acute, entire or obscurely crenulate; above glabrous except the edge fringed with multicellular hairs; beneath glabrous except the midrib and elevated nerves about 12 pairs; scurfily hairy; 2.5 to 3.5 in. long, 1.25 in. wide; petiole scurfy-hairy .125 to .375 in. long. *Peduncles* subterminal, 1.5 in. long, 1-flowered, rufous-hairy; bracts 2, alternate, linear, minute; pedicel .5 in. *Calyx*-lobes linear, hairy, .125 in. long. *Corolla* campanulate, .5

in. long, apparently white; lobes broad, rounded. *Stamens* 2, very short; anthers subglobose. *Style* slender, pubescent. *Capsule* (unripe) cylindric, velvety, .75 in. long, including the style.

SELANGOR: above the Gap on the road to the Sempang mine, 3000 to 4000 ft., *Curtis*—a single specimen.

A very distinct plant of a weedy habit, with solitary flowers of the type of *P. cordata*.

3. *PARABŒA SCORTECHINII*, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 66 (1905). *Stem* herbaceous, glabrous. *Leaves* opposite; ovate acuminate; base rounded, inæquilateral; margins crenate; quite glabrous; nerves 8 pairs; 3 to 3.5 in. long, 1 to 2.5 in. wide; petiole .5 in. long. *Peduncle* slender, erect, subterminal, 3 in. long, glabrous; branches dichotomous, few, 1 in. long; flowers solitary on the ends of the branches. *Calyx*-lobes free almost to the base, oblong obtuse, .125 in. long, glabrous, fleshy. *Corolla* campanulate, .5 in. long, glabrous; lobes rounded. *Anthers* broad, elliptic; filaments very short.

PERAK: *Scortechini* (no number or locality).

A single incomplete specimen. The plant is allied to *P. cordata*, of which it has quite the flowers, but is quite glabrous.

4. *PARABŒA CÆRULEA*, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 66 (1905). *Stem* woody, 3 to 4 in. long, .125 in. through. *Leaves* crowded at the top, narrowly lanceolate, linear acuminate, narrowed gradually to the base; 4 to 5 in. long, .25 in. wide; above dark green, nearly glabrous; midrib prominent, beneath pale cinnamon colour; nerves about 30 pairs joined at the tips. *Peduncles* slender, axillary, 4 in. long, pubescent, 1- to 2-flowered. *Calyx*-lobes linear, .125 in. long, obtuse. *Corolla* campanulate, .5 in. long and nearly as wide at the base, pubescent, base pale; lobes deep blue, rounded. *Stamens* 2; filaments very short, sigmoid; anthers broad, rounded, oblong. *Style* fairly stout; stigma heart-shaped. *Capsule* very narrow, cylindric, 1 in. long.

TRINGGANU: Bundi, *E. Rostado*. The upper part of the stem among the leaves is covered with silvery hairs.

5. *PARABŒA PYROLIFLORA*, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 67 (1905). *Stem* woody, 3 in. tall or more, pubescent. *Leaves* alternate, ovate or ovate lanceolate, acuminate at both ends; 3 to 4 in. long, 1.5 in. wide; entire; bright green, silky pubescent above, beneath paler; petiole over 1 in. long, pubescent. *Peduncles* several from the upper axils, erect, 3 to 4 in. long, shortly hairy. *Calyx*-lobes lanceolate, short-pubescent. *Corolla* campanulate, funnel-shaped, white, .4 in.,

long; lobes short, rounded. *Stamens* 2; filaments short and thick; anthers large, elliptic. *Style* thick, curved upwards, longer than the corolla; stigma very small, capitate. *Capsule* spreading, 1 in. long, terete, terminated by rather a long style, glabrous. *Didymocarpus pyroliflora*, Ridley in Trans. Linn. Soc. Ser. 2, III. 330.

PAHANG: Tahan river woods, Ridley 2164.

6. *PARABEA CAPITATA*, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 67 (1905). Stemless or with a stout rootstock. *Leaves* in a rosette, orbicular, base rounded, subpeltate; 6 in. long, 5 in. wide; bright green, glabrous above, ochre-yellow beneath; tomentose; nerves raised, reticulate; petiole stout, 2 in. long. *Peduncle* slender, 8 in. tall; flowers numerous in an umbel on the top, with 2 broad, blunt, oblong bracts, .25 in. long, below. *Pedicels* .5 in. long. *Calyx* campanulate; lobes linear, oblong, obtuse, .3 in. long, green, hairy. *Corolla* .5 in. across; lobes subequal, rounded, white. *Filaments* very short, straight; anthers reniform. *Style* curved up, longer than corolla, white. *Capsule* spreading, linear, straight, beaked, 1.5 in. long.

PERAK: Bujong Malacca, Curtis 3215; Kamuning, Machado. On limestone rocks.

VAR. *oblongiflora*, Ridley. *Leaves* oblong, narrowed at the base.

PERAK: Kuala Dipang and Sungei Siput, Curtis 3107; Tambun Ridley 9832; Batu Kuran, Scortechini 1581; Goping, King's Collector 456, 4325.

7. *PARABEA FERRUGINEA*, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 68 (1905). Stemless or nearly so. *Leaves* in a rosette, ovate cordate, obtuse, crenulate; above covered with scattered hairs, below tomentose with longer hairs, paler; nerves elevated; 3 in. long, 2.5 in. wide; petiole 1.5 to 2 in. long. *Peduncles* 3 in. long, ferruginous-tomentose; cyme compact, scorpioid, ferruginous-hispid. *Calyx*-lobes as long as the corolla, green, ferruginous-hispid, lanceolate. *Corolla*-tube very short; limb explanate, not bilabiate; lobes broad, obovate, obtuse, subequal and similar, white or tinted with rose. *Stamens* 2, short; filaments broad, spatulate, thick; apex 3-toothed; anthers conic, connate by the tips. *Ovary* conic; stigma rounded, entire, discoid.

KEDAH: Lankawi, on damp rocks, Curtis 2566.

8. *PARABEA REGULARIS*, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 68 (1905). *Stem* woody, 1.5 in. long. *Leaves* crowded at the top, very unequal, oblong-lanceolate, obtuse, base cuneate inæquilateral; margins crenulate; dark green, glabrous above, purple, minutely tomentose beneath, with elevated nerves; 3 in. long, 1.5 in. wide; petiole 1.5 in. long, tomentose. *Peduncles* slender, pubescent, 1 in. long; branches

very short and slender, .25 in. long, umbelled, brown-tomentose; bracts lanceolate, obtuse; flowers few, very small, very shortly pedicelled. *Calyx*-lobes lanceolate, brown-tomentose, as long as the corolla-tube. *Corolla* hardly .25 in. across, white; lobes oblong, obtuse, equal, not bilabiate. *Stamens* 2; filaments sigmoid, thick; anthers rounded, ovoid. *Style* longer than stamens; stigma capitate. *Capsule* .5 in. long, cylindric, scabrid, rather thick, straight. *Didymocarpus regularis*, Ridley in Journ. Linn. Soc. XXXII. 515.

KEDAH: Lankawi Islands, *Curtis*.

9. *PARABŒA POLITA*, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 69 (1905). Stemless. *Leaves* in a rosette, ovate, crenate, obtuse; base rounded; above deep shining green, beneath ochreous tomentose, with nerves and nervules reticulate; 1 to 8 in. long, 4 to 4.5 in. wide; petiole 4 in. long. *Peduncle* over 1 ft. long, slender, with brown ochreous fur; branches few, 3 in. long, umbellate; bracts linear, oblong obtuse, brown-woolly; pedicels .25 in. long. *Calyx*-lobes linear, green, .125 in. long. *Corolla* sub-bilobed, .5 in. across, white, back tinted pink; lobes rounded. *Stamens* 2; filaments thickened at the base; anthers orange, reniform. *Style* stout, pink at base, white above; stigma capitate.

PERAK: Bujong Malacca, *Curtis* 3214 *part*.

Ridley thinks it is perhaps a hybrid between *P. capitata* and *P. vulpina*.

10. *PARABŒA VULPINA*, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 69 (1905). *Stem* 2 in. long, thick, covered with red wool. *Leaves* elliptic, rounded at each end, crenulate, above sprinkled with pale multicellular hairs, beneath covered densely with branched rufous hairs arranged stellately; nerves beneath strongly elevated, 6 pairs; reticulations elevated; 1.5 to 3 in. long, 1 to 2 in. wide; petiole 1 to 3 in. long, densely red-woolly. *Peduncles* slender, 6 to 8 in. long, red, with a few branched hairs; branches slender, 1 to 3 in. long, trichotomous; bracts very small, linear, obtuse, glabrous. *Calyx*-lobes narrow, linear, glabrous. *Corolla* white, .25 in. across; lobes rounded, subequal. *Stamens* 2; anthers very large, reniform. *Style* short, thick. *Capsule* cylindric, narrow, glabrous.

PERAK: Bujong Malacca, *Curtis* 3214; Hot Springs, Ipoh, *Curtis* 3132. On limestone rocks.

11. *PARABŒA LAXA*, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 70 (1905). *Stem* very short, woody, thickly brown-tomentose. *Leaves* obovate, coarsely crenate-serrate, narrowed at the base into the winged petiole; 3 to 7 in. long, 2 to 3 in. wide; dull green, densely hairy, tomentose on both surfaces. *Peduncle* slender, 5 to 6 in. long, terminated by a much-branched umbel of slender branches 3 in. long; pedicels

slender, .125 in. long; flowers numerous; bracts very small. *Calyx* shortly 5-cleft; lobes lanceolate, short, green. *Corolla* .125 in. across, white or tinted rosy; upper lobes broad, oblong, recurved; lower lip shortly trifid; central lobe broadest. *Filaments* short, swollen in the middle; anthers yellow, reniform. *Style* longer than stamens. *Capsule* linear, cylindric, straight, .5 in. long, tipped with the elongate style.

KEDAH: Lankawi at Kwah, *Curtis* 2571.

12. *PARABŒA CURTISII*, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 70 (1905). Stemless. *Leaves* oblong, elliptic, crenate, obtuse; 6 in. long, 2.5 in. wide; above sprinkled with hairs; petiole rufous-hairy, 1.5 in. long. *Scapes* 10 in. long, rufous-tomentose, bearing an umbel of 4 or 5 branches at the top about 2 in. long; bracts at base of umbel oblong, obtuse, .25 in. long; pedicels short, rufous-tomentose. *Calyx*-lobes linear, oblong, obtuse, hairy, .125 in. long. *Corolla* .5 in. across, white; buds tinted pink; tube very short; limb bilobed; upper lobes short, rounded, lower lobes larger. *Stamens*: filaments very short, thick, curved; anthers reniform, triangular. *Style* much longer than stamens, bent. *Ovary* cylindric; stigma wide, discoid. *Capsule* (unripe) cylindric, acuminate, straight.

PERAK: Bujong Malacca, *Curtis* 3214.

13. *PARABŒA OBOVATA*, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 71 (1905). *Stem* short. *Leaves* crowded at the top, thin, obovate, blunt; base cuneate; 3 in. long, 1.5 in. wide; thinly arachnoid on both surfaces, beneath yellowish; petiole .25 in. long. *Peduncle* slender, 3 to 6 in. long, glabrous; branches few, terminal; bracts narrowly oblong, obtuse. *Calyx*-lobes oblong, obtuse, glabrous. *Corolla* .25 in. across; lower lip longer than upper one; lobes oblong, rounded. *Stamens* 2; anthers reniform; filaments short and thick. *Style* short and thick; stigma capitate.

KEDAH: Lankawi, Gunong Chinchang, *Curtis*. One specimen only seen.

9. *BŒA*, Commers.

Herbs or shrublets with a woody stem. *Leaves* opposite or whorled, generally on the back. *Peduncles* axillary, usually elongate, laxly or compactly cymose or paniced; bracts small; flowers large or small, blue or white. *Calyx* of 5 narrow sepals. *Corolla* widely campanulate, with a short tube usually distinctly 2-lipped; lobes ovate, obtuse. *Stamens* 2, perfect, with short curved thick filaments; anthers ovoid, coherent; cells ovoid. *Disk* absent. *Ovary* sessile; style as long, glabrous above; stigma small, capitate. *Capsule* slender, cylindric or

fusiform-cylindric, when ripe spirally twisted. *Seeds* minute.—**DISTRIB.**
Species about 22 in India, Siam, China, and Malaya.

Corolla limb 1·5 in. across, blue; sepals pubescent ..	..	1. <i>B. paniculata</i> .
Corolla limb less than 1 in. across:—		
Calyx-lobes more or less pubescent:—		
Stems 1 ft. or more in height:—		
Corolla blue:—		
Leaves white beneath .. .. .	..	2. <i>B. verticillata</i> .
Leaves yellowish-brown beneath .. .. .	..	3. <i>B. cærulescens</i> .
Corolla white .. .. .	..	8. <i>B. suffruticosa</i> .
Stems under 6 in. in height:—		
Leaves arachnoid above; corolla rose-pink .. .. .	..	5. <i>B. lanata</i> .
Leaves glabrous above .. .. .	..	6. <i>B. acutifolia</i> .
Calyx-lobes glabrous:—		
Leaves arachnoid above; corolla white with pink mouth .. .. .	..	4. <i>B. elegans</i> .
Leaves glabrous above:—		
Corolla pale lilac .. .. .	..	7. <i>B. divaricata</i> .
Corolla white .. .. .	..	9. <i>B. parviflora</i> .

DOUBTFUL SPECIES.

10. *B. patens*. 11. *B. glabra*. 12. *B. ferruginea*.

1. *BÆA PANICULATA*, Ridley in Journ. Linn. Soc. XXXII. 519 (1895).
Stem-base woody, 4 in. or more long, .5 in. thick; above a rosette of leaves; upper part of stem 1 ft. or more long, stout, deeply grooved, white-arachnoid; branches numerous, whorled, erect, 6 in. long, covered with brown wool. *Leaves* crowded in a rosette at the top of the woody portion of the stem, lanceolate acuminate, narrowed for a long distance at the base; 6 in. long, 1 in. wide; above grey arachnoid, beneath greyish-white with cinnamon-coloured raised nerves. *Flowers* numerous; pedicels .5 in. long; bracts 4 or 5 at each whorl of branches, leafy. *Calyx*-lobes short, lanceolate, pubescent, .125 in. long. *Corolla*-tube very short; limb 1·5 in. wide, blue; lobes large, rounded, unequal. *Filaments* short and thick, .25 in. long. *Style* curved, as long as stamens. *Capsule* .75 in. long, thick. Ridley in Journ. Str. Br. R. As. Soc. No. 43, 72

SELANGOR: limestone rocks, Kuala Lumpur, *Kelsall* and *Ridley* 1970, 1976 and 8226. PERAK: Sungei Siput, *Curtis* 3105; Kuala Dipang, *King's Collector* 8271; Batu Kuran, *Scortechini* 1611. A superb plant growing in the cracks of limestone rocks.

2. *BÆA VERTICILLATA*, Ridley in Journ. Linn. Soc. XXXII. 519 (1895).
Stem-base woody, 3 in. or more long, nearly .25 in. in diameter; above herbaceous, 1·5 ft. tall, 4-angled, white-arachnoid with branches whorled, each whorl 3 in. or less apart. *Leaves* whorled, lanceolate acuminate, narrowed at the base into a petiole; 4 in. long, .75 in. wide or more;

above grey-arachnoid, beneath white-arachnoid with raised nerves. *Flowers* numerous, blue; bracts leafy, .25 to .5 in. long. *Calyx*-lobes lanceolate subulate, arachnoid, .125 in. long. *Corolla* .5 in. wide; lobes rounded. *Stamens* very short; anthers pear-shaped. *Style* much longer than stamens, straight. Capsule fusiform, acuminate, .5 in. long. Ridley in Journ. Str. Br. R. As. Soc. No. 43, 73.

SELANGOR: limestone rocks at Kuala Lumpur, *Kelsall, Ridley* 1975, 8551.

3. *BÆA CÆRULESCENS*, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 73 (1905). Whole plant over 2 ft. tall; upper part of stem stout, grooved, woolly. *Leaves* oblanceolate, subobtuse, narrowed to the base; above dark green, densely pubescent, beneath ochreous covered with felted wool; 6 to 8 in. long, 1.25 to 2 in. wide; petiole winged to the base or not. *Panicle* 2 ft. or more long, large; branches whorled, yellow-woolly; bracts below leaf-like, above linear, narrow, yellow. *Calyx*-lobes lanceolate, woolly. *Corolla*-tube very short; limb .75 in. across, pale blue, upper lobe shorter; lobes rounded; lower lip unequally lobed, longer, central lobe longest. *Stamens* 2; anthers reniform, conic, large; filaments short, curved. *Style* bent on the cylindric ovary, pubescent; stigma large, discoid. *Capsule* thick, glabrous, .75 in. long.

PERAK: Sungei Siput, *Curtis* 3137; Kinta, *King's Collector* 7175, 7062, 8276.

4. *BÆA ELEGANS*, Ridley in Journ. Linn. Soc. XXXII. 522 (1895). *Stem* about 6 in. long, woody, decumbent, .125 in. thick, arachnoid. *Leaves* whorled in threes, .5 to 3 in. apart, lanceolate acute, narrowed to the base; 1 to 2.5 in. long, .25 to .5 in. wide; above grey-arachnoid, beneath cinnamon-arachnoid. *Peduncles* from the upper axils, slender, glabrous, 6 in. long; cyme terminal, 3 in. long, with few slender branches. *Calyx* very short; lobes lanceolate, glabrous. *Corolla* .5 in. across, with broad rounded lobes, white-pink in the mouth. *Anthers* oblong. *Style* rather short; stigma clubbed. *Capsule* 1 in. long, glabrous, linear, acuminate. Ridley in Journ. Str. Br. R. As. Soc. No. 43, 74.

KEDAH: Gunong Jerai on granite precipices, *Ridley*.

5. *BÆA LANATA*, Ridley in Journ. Linn. Soc. XXXII. 520 (1895). *Stem* short, stout, woody, 2 in. long, curved, with white wool. *Leaves* crowded, lanceolate acuminate, narrowed into the petiole; arachnoid above, densely woolly beneath; 3 in. long, .75 in. wide; petiole woolly, 3 in. long, winged to base. *Panicles* few, branched, axillary, dense, 1 to 5 in. long. *Calyx* as long as the corolla-tube; lobes lanceolate, woolly outside. *Corolla* thin, .5 to .75 in. across, glabrous, rose-pink;

lobes rounded. *Anthers* subglobose. *Style* thick. *Capsule* .5 in. long, thick, glabrous. Ridley in Journ. Str. Br. R. As. Soc. No. 43, 74.

KEDAH: Langkawi, Dayong Bunting, on limestone rocks, *Curtis* 2569.

6. *BÆA ACUTIFOLIA*, Ridley in Journ. Linn. Soc. XXXII. 519 (1895). *Stem* woody, 3 in. or more long, .25 in. through; internodes .5 in. long. *Leaves* crowded at the top, oblanceolate, acute, narrowed to the base; 6 in. long, 1.5 in. wide; above glabrous dotted, beneath cinnamon-arachnoid. *Panicles* axillary, 6 in. long; peduncles arachnoid; branches short, slender. *Calyx*-lobes 3, lanceolate, acute, .125 in. long, arachnoid. *Capsule* cylindric, acute, glabrous, .75 in. long. Ridley in Journ. Str. Br. R. As. Soc. No. 43, 75.

KEDAH: Langkawi, Goa Chinta, *Curtis* 2791.

7. *BÆA DIVARICATA*, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 75 (1905). *Stem* about 4 in. tall, thick and woody. *Leaves* in a rosette on the top, oblanceolate, crenulate, obtuse, narrowed into a winged petiole; nerves and nervules beneath elevated, 15 pairs; above glabrous, beneath covered with a thin brownish tomentum; 7 in. long, 2.5 in. wide. *Peduncles* rather stout, terete, smooth, 7 to 16 in. tall; branches umbellate, decomposed, 1 ft. or more long; pedicels of flowers .2 in. long, covered with brown fur. *Calyx*-lobes lanceolate, acute, green, glabrous, shorter than the corolla-tube. *Corolla* .25 in. across, pale lilac; tube short, dilated; limb bilabiate, lobes rounded. *Stamens*: anthers connate, rounded with acute bases; filaments thick, sigmoid. *Style* slender; stigma horseshoe-shaped. *Capsule* cylindric, strongly twisted, 1 in. long.

KEDAH: Lankawi, Ayer Hangat, *Curtis* 3683.

8. *BÆA SUFFRUTICOSA*, Ridley in Journ. Linn. Soc. XXXII. 518 (1895). A branching shrub, 1 to 2 ft. tall, with rather slender branches .125 in. through, angled, slightly arachnoid. *Leaves* scattered, lanceolate, subacute, narrowed at the base; 3 in. long, .5 in. wide; above nearly glabrous, punctate, beneath covered with brownish tomentum; nerves conspicuous; petiole .25 to .5 in. long. *Panicles* axillary, dense, 1 in. long, with short branches brownish-woolly; buds brown-woolly. *Calyx* longer than the corolla-tube; lobes linear, lanceolate, thick, tomentose outside. *Corolla* .25 to .35 in. across, white; lobes short, oblong, rounded. *Anthers* oblong, obtuse. *Capsule* fusiform, very thick, .25 in. long, tipped with the long style. Ridley in Journ. Str. Br. R. As. Soc. No. 43, 76.

KEDAH: Langkawi, on a small island north of Kwah, *Curtis* 3682, 2565.

9. *BÆA PARVIFLORA*, Ridley in Journ. Str. Br. R. As. Soc. No. 43,

76 (1905). *Stem* slender, shrubby, branching, covered with ferruginous tomentum. *Leaves* lanceolate, acuminate; base cuneate, unequal; 4 in. long, 1 to 1·25 in. wide; above glabrous, beneath covered with rusty wool; nerves elevated, 11 pair. *Peduncle* 6 in. long, slender, glabrous; panicle umbellate, of 6 slender branches in a terminal whorl; branchlets glabrous, numerous, slender; bracts very narrow, linear; flowers very small, numerous, white; pedicels slender, ·125 in. *Calyx*-lobes lanceolate, glabrous, 5. *Corolla* very small, white; tube very short; upper lobes subacute, lower ones oblong. *Anthers* large, reniform. *Style* shorter than anthers. *Capsule* very slender, cylindric, ·25 in. long, terminated by the slender style.

PERAK: Hot Springs at Ipoh and Sungei Siput, not common, *Curtis* 3134; Kinta, *King's Collector* 7108. On limestone rocks.

DOUBTFUL SPECIES.

10. *BŒA PATENS*, Ridley in Journ. Linn. Soc. XXXII. 520 (1895). Almost stemless. *Leaves* rosulate, oblong, obtuse, serrulate-crenulate, inæquilateral; 4 to 6 in. long, 2 to 3 in. broad; upper surface softly pubescent, lower pale ferruginous-tomentose; petiole 1 in. long. *Peduncle* stout, terete, 18 in. long, softly ferruginous-lanate; branches long, divaricate, 2-forked; primary bracts oblong, ·25 in. long, secondary smaller; cymules scorpioid, few-flowered; flowers small, white, ·125 in. broad; pedicels ·06 in. long. *Calyx*-lobes free to the base, short, lanceolate, acute, glabrous. *Corolla* campanulate, glabrous; lobes 2 oblong-obtuse, 3 ovate-obtuse, shorter and broader. *Stamens* with short slender curved filaments as long as tube; anthers large, oblong. *Pistil* glabrous; ovary cylindric, attenuated into a slender little-exsert style; stigma small, scarcely dilated. *Capsule* ·5 in. long, glabrous, very slender.

SIAMESE STATES: Pungah, *Curtis*.

11. *BŒA GLABRA*, Ridley in Journ. Linn. Soc. XXXII. 521 (1895). A succulent, glabrous herb; stem short, 1 to 2 in. long. *Leaves* undulate, ovate-rotundate, inæquilateral, 6 in. long, 3·5 in. broad or broader; petiole 1 to 2 in. long, thick; upper leaves smaller, opposite. *Peduncles* subterminal, 3 to 4 in. long, thick; cymes terminal, congested, scorpioid, ·5 in. long; pedicels short. *Calyx*-tube short, conical; lobes 5, equal, obtuse, truncate, ·125 in. long. *Corolla* white, ·5 in. broad; lobes rounded, obtuse. *Stamens* 2; filaments sigmoid, broad at the base, attenuate above; anthers oblong, acute on both sides, rather large. *Style* cylindric, thick, glabrous, curved; stigma scarcely thickened, obliquely ovate.

SIAMESE STATES: Pungah, *Curtis* 3039.

12. *BÆA FERRUGINEA*, Ridley in Journ. Linn. Soc. XXXII. 521 (1895). Stemless or with a short thick stem; roots large and thick. *Leaves* many, congested, spreading, ovate, cordate, obtuse, crenulate; upper surface clothed with sparse hairs, lower green, paler, tomentose, the raised nerves clothed with long hairs; when dry somewhat black above, ferruginous-tomentose beneath; blade 3 in. long, 2.5 in. broad; petiole 1.5 to 2 in. long. *Peduncles* 3 in. long, ferruginous-tomentose; cyme scorpioid, ferruginous-hispid. *Calyx*-lobes linear-lanceolate, as long as the corolla, green, ferruginous-hispid. *Corolla* .3 to .5 in. broad, white or pink, spreading; lobes broad, equal, obovate-obtuse; tube very short. *Stamens* 2, short; filaments broad, spatulate, 3-toothed at apex; anthers yellow, conical, cuneate at the tips. *Ovary* conical, attenuate in a short, curved, cylindric, narrowed style; stigma rather broader, flat, entire.

KEDAH: Langkawi Island, on damp rocks, *Curtis* 2566.

Ridley remarks that, not having seen the fruit, he is uncertain as to the genus.

10. *PHYLLOBÆA*, Benth.

Herbs or half-shrubby plants. *Leaves* opposite, petioled. *Cymes* pedunculate, many-flowered; bracts large, conspicuous; flowers large, pink or blue. *Calyx* large, 2-lipped; one lip 2-lobed, the other 3-lobed or of 3 large connate sepals. *Corolla* broadly campanulate, 2-lipped, 3- to 5-lobed. *Stamens* 2, short; anthers large, rounded. *Capsule* lanceolate, at length twisted.—*DISTRIB.* Species 2, one Burmese, one Malayan.

PHYLLOBÆA SPECIOSA, Ridley in Journ. Linn. Soc. XXXII. 522 (1895). A shrub, 1 or 2 ft. tall; stems white-tomentose. *Leaves* in distant pairs, lanceolate-acuminate, 6 in. long, 1.5 in. wide; above glabrous, beneath white-arachnoid; petiole 1 in. long. *Peduncle* stout, lateral, erect, nearly a foot tall; flowers sessile, scattered; bracts ovate, lanceolate, .5 in. long, white-arachnoid. *Calyx* of 3 sepals, connate, ovate, oblong, woolly, .4 in. long. *Corolla* 1 in. long, blue; tube broad; lobes 3, two oblong-truncate, the third much broader. *Stamens* short, not longer than the ovary. *Style* long, woolly. *Capsule* 1 in. long, lanceolate, cylindric, acuminate, woolly.

KEDAH: Langkawi, common on limestone rocks on the small islands, *Curtis* 2564.

11. *BÆICA*, Clarke.

Herbs or half-shrubby plants with the habit of *Bæa*. *Leaves* oblong, elliptic or lanceolate, more or less tomentose or hairy. *Inflorescence* racemose or paniced, axillary; flowers small, lilac or white. *Calyx* 5-fid. *Corolla*-tube very short; lobes subequal, rounded. *Sta-*

mens 4; filaments very short; anthers rounded, connivent. *Style* curved, larger than the stamens. *Capsule* linear cylindrical.—DISTRIB. Species 4 or 5, in Assam, Burma, and the Malay Peninsula.

Ridley says: "Most of the few described species are based on flowerless specimens, and are all very similar and closely resemble *Bœa divaricata* in habit, but the capsule is straight and not twisted. The type-species, however (*B. filiformis*, Clarke), has 4 stamens instead of 2. The Malayan one described below differs from these in habit, and I have seen no fruit, but there is no other genus to which it can be referred on account of its 4 very short stamens arranged in a circle round the pistil. The only other genus allied to it is *Platystemma*, a Himalayan plant with distinctly 2-lipped flowers."

BŒICA BRACHYANDRA, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 78 (1905). Stemless. *Leaves* obovate, serrate, hairy, dark green, obtuse; 3 in. long by 1.5 in. wide; nerves 6 or 7 pair; covered beneath with long red hairs; back of leaf punctate. *Scape* short, few-flowered, about 3 in. long, hairy, unbranched. *Calyx*-lobes free nearly to base, linear, hairy, green, nearly as long as corolla-lobes. *Corolla*-tube very short; lobes broad, rounded, oblong, explanate, subequal, pale lilac, about .5 in. across. *Stamens* 4; filaments very short; anthers broad, waxy, subglobose, connivent round the pistil. *Style* longer than stamens, slender, curved, white. *Capsule* cylindrical, narrow, 1 in. long, scabrid, straight, on pedicels elongated to .5 in.

KEDAH: Langkawi, Gunong Chinchang, at Kwala Malacca, Curtis.

Ridley says this plant was found quite dried up in February, 1899, but was brought in alive and flowered in the Botanic Gardens, Penang.

12. ORCHADOCARPA, Ridley.

Herb or shrublet, with opposite unequal leaves. *Flowers* small, blue, racemose or cymose, pedicelled. *Calyx*-lobes free to base, narrow-lanceolate. *Corolla*-tube short; limb 2-lipped unequally. *Stamens* 2; filaments short, exsert, sinuate, glabrous; anthers bilobed, reniform, connivent by their edges. *Ovary* hairy, oblong; style short; stigma capitate. *Capsule* oblong, hairy, enclosed in the sepals.—DISTRIB. One species, Malayan.

ORCHADOCARPA LILACINA, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 78 (1905). *Stem* short to 4 in. long, stout, woody. *Leaves* crowded at the top, long-petioled, thin, ovate or ovate-lanceolate, acute, strongly serrate, covered with closely-felted short hairs; base broad, in-æquilateral; 3 to 7 in. long, 1.5 to 3 in. wide; petiole slender, 3 to 6 in. long. *Peduncle* 3 to 4 in. long, pubescent, villous, bearing a terminal, pubescent, umbelliform panicle, or simply racemose. *Calyx*-lobes linear, pubescent, .1 to .2 in. long. *Corolla* pale lilac-blue; tube very short; limb dis-

tinctly bilabiate, upper lip smaller lobes short rounded, lower lip longer, trifid; median lobe longer than the others, oblong-obtuse, pubescent across. *Stamens* 2; filaments from the mouth of the corolla-tube, thick, twisted at the top; anthers large, reniform. *Ovary* oblong, pubescent; style distinct; stigma very small, capitate. *Capsule* short, oblong, hairy, enclosed in the calyx, beaked.

PERAK: *Scortechini* 406; Gunong Batu Putih, *Wray* 298, 302.

13. LEPADANTHUS, Ridley, n. gen.

Herb with fistular stem. *Leaves* opposite, petioled, ovate, toothed. *Flowers* in axillary or terminal, flexuose, distichous racemes. *Calyx*-lobes free nearly to the base, ovate acute. *Corolla* as long as calyx, bilabiate; upper lobe much the shorter. *Stamens* 2 fertile; anthers elliptic. *Ovary* elliptic; style long; stigma oblique, entire. *Capsule* as long as calyx-lobes, loculicidal; placentæ thick, elevated. *Seeds* very minute, warted.—DISTRIB. One species.

The plant on which the genus is founded has the habit of *Rhyncotecum*, but the fruit is capsular.

[LEPADANTHUS, Ridley, gen. nov. Herbacea, caule fistuloso. *Folia* opposita, petiolata, ovata, dentata. *Flores* distichi in racemis axillaribus vel terminalibus flexuosis. *Calycis* lobi fere ad basin liberi, ovati, acuti. *Corolla* calyci æqualis, bilabiata, labio superiore multo brevior. *Stamina* 2 fertilia; antheræ ellipticæ. *Ovarium* ellipticum, stylo longo, stigmatē obliquo, integro. *Capsula* calycis lobis æquilonga, loculicida, placentis crassis elevatis. *Semina* minutissima, verrucosa.]

LEPADANTHUS FLEXUOSA, Ridley, n. sp. A herb, reaching 18 in. in height; stem hairy, fistular. *Leaves* very thin when dry; ovate, sub-acute, rounded and slightly unequal at base, strongly toothed; 5 in. long, 4 in. wide; nerves about 8 to 10 pair, hairy; petiole slender, 3 to 4 in. long. *Racemes* several, pubescent, 3 to 4 in. long, including the 1 to 1·5 in. long peduncle; rachis flexuose with distant alternate flowers on capillary secund pedicels ½ in. long; bracts in pairs, linear, deflexed, 1·25 in. long. *Calyx*-lobes 5, ovate, acuminate, pubescent, 3-nerved. *Corolla* small; tube short, thick; upper lip bifid, much shorter than the lower, glabrous. *Stamens* 2; filaments extremely short, adnate to the corolla-tube; anthers elliptic. *Ovary* elliptic; style pubescent, as long as calyx-lobes or longer; stigma clavate, oblique. *Capsule* 25 in. long, oblong, glabrous. *Seeds* elliptic, dark red.

KEDAH: inside the caves, Gunong Grenong, *Fox* 3811 (a poor specimen only).

[*L. FLEXUOSA*, Ridley, sp. nov. Herba pubescens caule 40–50 cm. alto fistuloso. *Folia* siccitate tenuissima, ovata, subacuta, rotundata, ad basin parum inæqualia, dentata; 12 cm. longa, 10 cm. lata; nervi utrinque 8–10, pubescentes; petiolus gracilis, 7–10 cm. longus. *Racemi* plures, pubescentes, cum pedunculo 7–10 cm. longi; rhachis flexuosa, floribus alternis distantibus, pedicellis secundis capillaribus; bracteæ geminæ lineares deflexæ, 3 mm. longæ. *Calycis* lobi 5, ovati, acuminati, pubescentes, trinervi. *Corolla* parva, tubo brevi crasso; labium superius bifidus, inferiori multo brevius. *Stamina* 2; filamenta brevissima, tubo corollæ adnata. *Ovarium* ellipticum; stylus pubescens, calycis lobis æquilongus vel longior; stigma clavatum, obliquum. *Capsula* 6–7 mm. longa, oblonga, glabra. *Semina* elliptica nigro-rubra.

PENINSULA MALAYANA: in Prov. Kedah in specubus ad Gunong Grenong.]

14. RHYNCHOGLOSSUM, Blume.

Herbs, succulent and nearly glabrous. *Leaves* opposite, thin. *Raceme* terminal, lax; flowers pendent. *Calyx* campanulate, toothed or lobed. *Corolla*-tube cylindric, narrowed above; limb bilobed; upper lobe very short bifid, lower much longer, 3-lobed. *Stamens* 2 perfect, affixed to the middle of the corolla-tube; anthers connivent; cells ellipsoid, parallel; staminodes 2, or absent. *Disk* cylindric. *Ovary* ovoid, glabrous; style longer; stigma dilate. *Capsule* included in the calyx, ellipsoid, membranous, 2-valved. *Seeds* narrowly ellipsoid, smooth.—*DISTRIB.* Species 2, in India, Malaya and the Philippines.

RHYNCHOGLOSSUM OBLIQUUM, Blume Bijdr. 741 (1826). Succulent herb, 20 in. tall. *Leaves* 1 to 3 in long, .5 to 1 in. wide; glabrous or nearly so, ovate-acuminate; petiole .5 in. long or less. *Racemes* lax, about 6 in. long; flowers numerous, pale to deep violet; bracteoles filiform, .1 to .2 in. long. *Calyx* tubular, .25 in. long, enlarged in fruit; lobes triangular or lanceolate. *Corolla* .6 in. long; lower lip several times longer than the upper one, subtrilobed. *Capsule* ellipsoid, .3 in. long. DC. Prodr. IX. 274; Clarke in DC. Monog. Phan. V. 161, in Comm. & Cyrt. Beng. t. 88, and in Hook. f. Fl. Br. Ind. IV. 367; Ridley in Journ. Str. Br. R. As. Soc. No. 43, 79. *R. Blumei*, DC. Prodr. IX. 274. *Wulfenia intermedia*, Wall. Cat. 408. *Loxotis intermedia*, Benth. Scroph. Ind. 57; G. Don Gen. Syst. Dichl. Pl. IV. 664. *L. obliqua*, R. Br. in Benn. Pl. Jav. Rar. 102, t. 24; Miq. Fl. Ind. Bat. II. 731, t. 35, fig. 3.

PERAK: Larut Hills, *Fox*; Batang Padang, *Wray* 1447, at 2000 ft. elevation.—*DISTRIB.* Tenasserim and Malay Islands.

15. EPITHEMA, Blume.

Small rock-herbs, succulent, pubescent; stems simple or branched. *Leaves* few, alternate or opposite above, petioled or sessile; ovate, usually cordate. *Peduncles* long, from the upper axils, erect; bract

single, ovate or cucullate; flowers small, blue or white, in a scorpioid cyme on short pedicels. *Calyx* campanulate; lobes 5, acute. *Corolla*-tube short; limb distinctly 2-lipped; lobes acute or obtuse, subequal. *Stamens*: 2 posterior perfect, 2 anterior ones sterile, shorter; anthers coherent. *Disk* unilateral or almost surrounding the ovary. *Ovary* ovoid; style longer; stigma subcapitate. *Capsule* globose, enclosed in the enlarged calyx on a thickened and a longer pedicel, splitting transversely (a pyxis). *Seeds* ellipsoid or oblong, spirally reticulate.—**DISTRIB.** Species about 6 Asiatic, all very closely allied, and one African.

EPITHEMA SAXATILE, Blume Bijdr. 738 (1826). Succulent herb, 3 to 12 in. tall; stem viscid, pubescent. *Leaves* very variable, opposite, ovate cordate, denticulate or crenulate, hairy; 1·5 to 6 in. long, 1 to 5 in. across; petiole ·25 to 1·5 in. long. *Peduncle* 1 to 2 in. long, viscid; cyme ·75 in. across, subtended by a broad sessile truncate denticulate bract; flowers numerous, subsessile. *Calyx* viscid, pubescent, tubular, split about half-way down into 5 narrow lobes ·25 in. long. *Corolla*-tube as long, straight, white; three upper lobes oblong, obtuse, tipped with violet; lower two connate, broader, subovate, denticulate, thinner, pellucid, tipped mauve with darker central spots; mouth of tube inside hairy. *Stamens* 4, in 2 pairs; filaments incurved, adnate to the mouth of the tube, white; anthers 2, oblong, connate, yellowish. *Ovary* ovoid, enclosed in a fleshy truncate yellow disk; style stout, glabrous; stigma capitate. *Capsule* globose, pubescent, surrounded by the much enlarged ovate acute sepals and borne on the thickened elongate to ·125 in. pedicel, circumsciss. *Seeds* very numerous, brown, elliptic, fusiform, spirally ribbed. DC. Prodr. IX. 278; Miq. Fl. Ind. Bat. II. 736; Zoll. Verz. Ind. Archip. 55; Clarke in DC. Monog. Phan. V. 178; Ridley in Journ. Str. Br. R. As. Soc. No. 43, 80.

KEDAH: Langkawi Islands, *Curtis* 2107. **PERAK**: Telor Pinang Ipoh, *Ridley*; Batu Kuran, *Scortechini* 1580; *King's Collector* 10941; Sungei Ryah, *Kunstler* 283; Goping, *King's Collector* 5872. **SELANGOR**: Kuala Lumpur Caves, *Ridley* 8217. **PAHANG**: Kota Glanggi, *Ridley*.—**DISTRIB.** Java, Borneo, Sumatra. On limestone rocks.

16. MONOPHYLLÆA, R. Br.

Succulent herbs with an unbranched stem and one large herbaceous cordate-ovate sessile leaf. *Peduncles* numerous, from the leaf-base, with racemose or cymose inflorescence; flowers small. *Calyx* deeply 5-cleft; lobes elliptic, obtuse. *Corolla* small, usually white; tube short, cylindrical; limb distinctly 2-lipped, lobes 5. *Stamens* 4 perfect; filaments

short; anthers cohering in pairs or altogether. *Disk* unilateral or a complete ring. *Ovary* 1-locular; style short; stigma capitate. *Capsule* membranous, enclosed in the enlarged calyx, irregularly splitting. *Seeds* oblong, minute, reticulate.—**DISTRIB.** Species 7, of the Malay Peninsula and Islands, and Siam.

Leaf glabrous; calyx-lobes not spreading in fruit

Calyx-lobes ovate, rounded; flowers white .. 1. *M. Horsfieldii*.

Calyx-lobes lanceolate, acute; flowers white and brown .. 2. *M. glabra*.

Leaf strigosely hairy; calyx-lobes spreading in fruit .. 3. *M. patens*.

1. **MONOPHYLLÆA HORSFIELDII**, R. Br. in Benn. Pl. Jav. Rar. 121 (1840), and Ann. Sc. Nat. 2, XIII. 160. *Stem* 6 in. to 1 ft. tall. *Leaf* ovate-cordate, 6 to 12 in. long, 1 to 12 in. wide; glabrous, glaucous beneath. *Racemes* 2 to 7, often stout, 9 in. long; flowers numerous, subsecund; pedicels .25 in. long, glabrous. *Calyx-lobes* glabrous, rounded, ovate, ribbed. *Corolla-tube* short, cylindrical; upper lip 2-lobed, lower 3-lobed; lobes rounded, white. *Stamens* 4, didynamous, glabrous; anthers connate. *Style* short, glabrous; pistil subglobose. *Capsule* globose, enclosed in the enlarged calyx-lobes. *Seeds* oblong, brown, reticulate, very numerous. DC. Prodr. IX. 274; Miq. Fl. Ind. Bat. II. 731; Clarke in DC. Monog. Phan. V. 182, and in Hook. f. Fl. Br. Ind. IV. 370; Ridley in Journ. Str. Br. R. As. Soc. No. 43, 82.

SELANGOR: Kuala Lumpur Caves, *Curtis*; *Beccari*. **PERAK:** Goping, *King's Collector* 443, 515.—**DISTRIB.** Sumatra: Batu Pantih (*Forbes* 2660); Java (*Lobb*). On limestone rocks.

2. **MONOPHYLLÆA GLABRA**, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 82 (1905). *Stem* succulent, 6 in. to 1 ft. tall. *Leaf* ovate-cordate, obtuse, glabrous; glaucous beneath; 2.5 to 6 in. long, 2 to 6 in. wide. *Racemes* slender, glabrous, 4 to 10, 2 to 8 in. long, lax; flowers numerous, in pairs; pedicels slender, .25 in. long, spreading, deflexed. *Calyx-lobes* .125 in. long in fruit, lanceolate, acute, glabrous, not spreading. *Corolla* brown and white. *Capsule* enclosed in the sepals, cylindrical, oblong.

SIAMESE STATES: Kasum, *Curtis* 3219.

3. **MONOPHYLLÆA PATENS**, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 82 (1905). *Stem* 1 to 4 in. long, viscid-hairy. *Leaf* ovate-cordate to ovate-lanceolate, strigose, hairy; 6 in. long, 4 to 6 in. across. *Racemes* slender, 4 to 20, pubescent, 4 to 5 in. long; flowers in pairs; pedicels slender, pubescent, .25 in. long in fruit. *Calyx-lobes* lanceolate, hairy, spreading in a stellate manner in fruit, ribbed. *Corolla-tube* short; lobes white. *Stamens* 4, glabrous, didy-

namous. Ovary ovoid; style short, thick, glabrous. Capsule globose, glabrous. Seeds numerous, black, tessellated.

SELANGOR: Kuala Lumpur Caves, Ridley 8222; King's Collector 7052. PERAK: Kinta, Curtis 3136; Sungei Siput, Curtis 3135; Batu Kuran, Scortechini 1574, 1579; Goping, Kunstler 449. On limestone rocks.

17. STAURANTHERA, Benth.

* Herbs, succulent, pubescent. Leaves alternate, the opposite ones reduced, falcate, elliptic, acuminate, inæquilateral. Cymes peduncled, lax; bracts small; flowers medium-sized, showy. Calyx campanulate; lobes 5. Corolla campanulate, rounded; tube short, shortly spurred or gibbous; limb 2-lipped; lobes rounded, nearly equal. Stamens 4 perfect; anthers connate, bilocular, bases diverging. Ovary subglobose or ovoid, no disk; style short. Capsule depressed, globose, irregularly split. Seeds minute, obovoid-reticulate.—DISTRIB. Species 3. Assam and Malay Islands.

Flowers large, base of corolla spurred ..	..	.. 1. <i>S. grandiflora</i> .
Flowers small, base of corolla not spurred ..	..	.. 2. <i>S. umbrosa</i> .

1. STAURANTHERA GRANDIFLORA, Benth. Scroph. Ind. 57 (1835). Succulent herb with a fleshy stem about 6 in. tall. Leaves 6 in. long by 4 in. wide or less; oblong, obtuse, crenulate; deep green above, bullate, glabrous, inæquilateral, pubescent on both sides; petiole 1 in. long. Cyme short, pubescent, 3 in. long, with a few (9) large flowers; bracts short, ovate; flowers 1.25 in. across. Calyx-lobes lanceolate, ovate, pubescent. Corolla-tube short and broad, with a short spur at the base; lobes short, broad, rounded, violet with a central yellow bar reaching to the spur. Stamens subequal, 4; filaments slender; anthers connate. Ovary ovoid; style shorter than the stamens; stigma capitate. Capsule 2 in. broad. Clarke in DC. Monog. Phan. V. 190, and in Hook. f. Fl. Br. Ind. IV. 371; G. Don Gen. Syst. Dichl. Pl. IV. 665. *S. grandifolia*, Dietr. Syn. Pl. III. 582; R. Br. in Benn. Pl. Jav. Rar. 121, and Ann. Sc. Nat. 2, XIII. 167; DC. Prodr. IX. 278; Hook. Bot. Mag. t. 5409; Floral Mag. Ser 1 (1866), t. 272; Miq. Fl. Ind. Bat. II. 735; Clarke Comm. & Cyrt. Beng. t. 89 bis; Ridley in Journ. Str. Br. R. As. Soc. No. 43, 83. *Glossanthus? grandiflora*, Benth. in Wall. Cat. 6395.

PENANG: Wallich 6395; rocks near Balik Pulau, Curtis. PERAK: Larút, King's Collector 2248.—DISTRIB. Burma. Rare, on rocks.

2. STAURANTHERA UMBROSA, Clarke in Comm. & Cyrt. Beng. t. 89 (1874). Stem 3 to 6 in. tall. Leaves ovate, oblong, falcate, inæquilateral, strigosely hairy especially beneath; 6 to 8 in. long, 2 to 4

in. wide. *Cymes* spreading, few- to 10-flowered; peduncles and pedicels hairy. *Calyx* shortly 5-lobed, cup-shaped; lobes triangular, .25 in. long in flower, larger and spreading in fruit. *Corolla* .5 in. long, white with a violet spot in the centre. *Ovary* unilocular. *Capsule* circumsciss near the base. Clarke in DC. Monog. Phan. V. 189, and in Hook. f. Fl. Br. Ind. IV. 731; Ridley in Journ. Str. Br. R. As. Soc. No. 43, 83. *Cyananthus umbrosa*, Griff. Notul. IV. 154; Ic. Pl. Asiat. t. 437.

PERAK: Telok Pinang, near Ipoh, *Ridley* 9773; Kinta, *King's Collector* 7144. SELANGOR: woods at the Kuala Lumpur Caves, *Ridley* 8224. PAHANG: Tahan Woods, *Ridley* 2183. JOHORE: Gunung Panti, *Ridley* 4166.—DISTRIB. Assam. A ground plant in damp rocky woods.

18. RHYNCHOTECUM, Blume.

Shrubs, little branched, young parts red-woolly. *Leaves* opposite or alternate. *Cymes* axillary, decomposed; flowers small, numerous. *Calyx* 5-cleft nearly to the base; lobes narrow. *Corolla* small, campanulate; limb 2-lipped; lobes 5, ovate or oblong, subequal. *Stamens* 4 perfect, affixed to near the corolla base; filaments short, curved; anther-cells 2, subparallel. *Ovary* sessile, ovoid; disk very small, annular or absent; style much longer than ovary; stigma subcapitate. *Berry* small, globose, with persistent style; pericarp pulpy. *Seeds* very small, smooth.—DISTRIB. Species 9, Indo-Malayan.

RHYNCHOTECUM PARVIFLORUM, Blume Bijdr. 775 (1826). A little-branched shrub about 3 ft. tall, leafy above, upper parts ferruginous-hairy. *Leaves* opposite, lanceolate, acute, cuneate at the base, serrate; 8 in. long, 3.5 in. wide; dark green, glabrous above except the midrib, covered with red wool beneath, thickest on the nerves; nerves 13 pairs; petiole 1 in. long. *Cymes* numerous, short, from the lower part of the stem, laxly branched, red-woolly; flowers very small, yellowish-white. *Calyx*-lobes nearly free to the base, linear-lanceolate, acute, woolly, .125 in. long. *Corolla* little longer than the calyx-lobes, campanulate; lobes oblong, obtuse, white. *Stamens* 4, very short; filaments short and thick. *Style* longer than the ovary. *Capsule* ovoid-globose, hairy, shorter than the sepals. G. Don Gen. Syst. Dichl. Pl. IV. 663; Dietr. Syn. Pl. III. 581; DC. Prodr. IX. 285; Zoll. Verz. Ind. Archip. (1854) 55; Miq. Fl. Ind. Bat. II. 750; Clarke in DC. Monog. Phan V. i. 195, and in Hook. f. Fl. Br. Ind. IV. 373; Ridley in Journ. Linn. Soc. XXXII. 523, and in Journ. Str. Br. R. As. Soc. No. 43, 84. *Isanthera parviflora*, Ridley in Trans. Linn. Soc. Ser. 2, III. 331.

PENANG: *Wallich*; Pulau Betong and Penara Bukit, *Curtis* 3035;

PERAK: Larút Hills, *Ridley*; *King's Collector* 2237; *Scortechini* 1222.
PAHANG: Kuala Tahan, *Ridley* 2171.—DISTRIB. Java, Sumatra.

19. CYRTANDROMŒA, Zoll.

Shrubs with square stems, leafy above. *Leaves* opposite, subequal, herbaceous, ovate elliptic or lanceolate, serrate, petioled. *Flowers* 1 to many, in axillary or basal cymes; bracts 2 in the middle of the pedicel. *Calyx* tubular, shortly 5-toothed or lobed, enlarged in fruit, usually red. *Corolla* large, white, tubular, thin, glabrous; tube dilated at apex; lobes rounded, subequal. *Stamens* 4 perfect, in 2 pairs, subsimilar; filaments linear; anthers ovoid, small. *Pistil* longer than stamens; stigma cup-shaped. *Capsule* globose or oblong, enclosed in the enlarged calyx, opening irregularly; walls membranous. *Seeds* numerous, sinuate, oblong, obtuse, ribbed, reticulate.—DISTRIB. Species 10, Malayan.

Flowers solitary, axillary; corolla nearly 1 in. long 1. *C. acuminata*.
Flowers in lax many-flowered cymes:—
Cymes slightly supra-axillary; corolla about 2 in. long 2. *C. megaphylla*.
Cymes borne on base of stem or on upper portion below the
leaves; corolla 1 in. long 3. *C. grandis*.

1. CYRTANDROMŒA ACUMINATA, Benth. and Hook. f. Gen. Pl. II. 1020 (1876). A shrubby plant, 3 to 4 ft. long; stem rather weak, hollow, young parts pubescent. *Leaves* lanceolate or ovate, narrowed into the petiole, acute, serrate, strigose, pubescent above, also on the nerves beneath; 4 to 6 in. long, 2 to 3 in. wide; petiole 1 in. long. *Flowers* solitary, axillary, on short .125 in. long, lanceolate, slender, hispid peduncles with 2 very small linear bracts in the middle. *Calyx* tubular, .5 in. long, glabrous, with short teeth, dull red. *Corolla* nearly straight, 1 in. long; tube thick; lobes rounded, white. *Capsule* oblong, 4-angled, .25 in. long. *Seeds* minute, deeply reticulate. Clarke in DC. Monog. Phan. V. i. 185, and in Hook. f. Fl. Br. Ind. IV. 370; *Ridley* in Journ. Str. Br. R. As. Soc. No. 43, 86. *Cyrtandra?* *acuminata*, Wall. Cat. 1808. *Busea subsessilis*, Miq. Fl. Ind. Bat. II. 733.

TRINGGANU: Bundi, *Rostado*; PENANG: *Porter* in *Wallich's Collector*, 808; *Maingay* (K.D.) 1232-2; *King*; Tonoh, *Machado*. PERAK: Larút Hills, *Ridley* 2917; *Scortechini* 83, 329; *King's Collector* 5342, 2139. SELANGOR: Ginting Bidai, *Ridley*. NEGRI SEMBILAN: Bukit Sulu, *Cantley*.

2. CYRTANDROMŒA MEGAPHYLLA, Hemsley in Hook. Ic. Pl. t. 1555 (1884). Herb about 3 ft. tall; stem bluntly 4-angled, pithy in the centre, pubescent. *Leaves* opposite, subequal, herbaceous, ovate,

acutely acuminate, coarsely serrate, base rounded or subcordate; 6 to 10 in. long, 3 in. wide; pubescent; petiole 3 to 5 in. long. *Cymes* from a little above the axils, lax, many-flowered. *Calyx* tubular, pubescent, shortly 5-toothed, .5 in. long, inflated in fruit. *Corolla* about 2 in. long, white, obliquely infundibuliform; lobes rounded, subequal. *Ovary* perfectly bilocular. Ridley in Journ. Linn. Soc. XXXII. 523, and in Journ. Str. Br. R. As. Soc. No. 43, 86.

PERAK: Larút Hills at 2100 ft. alt., *Wray*; *Scortechini* 584; Gunong Batu Putih, *King's Collector* 8155. SELANGOR: Ginting Peras, *Ridley* 7602.

3. CYRTANDROMŒA GRANDIS, Ridley in Journ. Str. Br. R. As. Soc. No. 43, 87 (1905). A large shrub, several feet tall; base of stem woody, .5 in. through, glabrous. *Leaves* opposite, equal, herbaceous, lanceolate acuminate, glabrous, narrowly acuminate at the base; margins dentate; 12 in. long, 4 in. wide; nerves elevated, 10 pairs; petiole 1 to 1.25 in. long. *Cymes* large, lax, borne on the base of the stem, and on the upper part below the leaves, many-flowered, 2.5 to 6 in. long, pubescent; pedicels .25 in. long. *Calyx* tubular, pubescent, with linear lobes, red, .5 in. long. *Corolla* white, 1 in. long; tube straight, thick; lobes rounded. *Capsule* globose, .5 in. long, enclosed in the enlarged calyx. *Seeds* minute, black, oblong, ribbed and reticulate.

PERAK: Ulu Bubong, *King's Collector* 10150; Gunong Batu Putih, *King's Collector* 8155. SELANGOR: Kuala Lumpur, *Curtis*; *Ridley* 10498; 15th mile Pahang Track, *Ridley* 8552; Bukit Hitam, *Ridley* 7576.

20. CYRTANDRA, Forst.

Half-shrubby plants, terrestrial or rarely epiphytic; stems often branched, usually tall. *Leaves* opposite, subequal or one smaller. *Cymes* axillary, on long or short peduncles, many-flowered; bracts large or small, free or connate; bracteoles ovate or narrowed or absent. *Calyx* tubular, 2- to 6-lobed, usually 5-lobed; lobes lanceolate. *Corolla*-tube short, usually pubescent, infundibular, straight; lobes 5, subequal or more or less distinctly 2-lipped, usually white-spotted or marked with yellow-brown or red. *Stamens* 2, perfect, shortly exsert or included, affixed to the corolla; anthers bilocular, connivent, free or coherent; staminodes small, 2 to 3. *Disk* annular or unilateral. *Ovary* ovoid or oblong; style long, filiform; stigma sub-bilobed. *Berry* sausage-shaped or ovoid, firmly fleshy, usually beaked with the persistent style. *Seeds* numerous, minute, ellipsoid, smooth or obscurely reticulate.—DISTRIB. About 170 species, in the Malay Peninsula and Archipelago eastwards to Polynesia.

Bracts free:—

Leaves of a pair with one usually manifestly smaller than the other, sometimes entirely suppressed, or less frequently (*C. pendula*) reduced to a subulate process opposite the perfect leaf:—

Leaves 12 in. long, their margins strongly toothed especially towards the apex, all quite alternate from suppression of one of each pair; calyx 5-lobed; corolla .5 in. long 1. *C. dispar*.

Leaves 7 to 9 in. long, their margins entire or occasionally (*C. pendula* sometimes) crenate:—

Bracts ovate acute; leaves with one of each pair usually smaller than the other and sometimes (*C. falcata* often) suppressed entirely; leaf-margins always entire; calyx 5-lobed:—

Bracts 1 in. long; leaves 7 to 9 in. long, main nerves about 12 pairs, prominent, both leaves of each pair always present and the two sometimes subequal; corolla over 1 in. long 2. *C. suffruticosa*.

Bracts .5 in. long; leaves 7 to 8 in. long; main nerves about 10 pairs, not prominent, one leaf of each pair always smaller than the other and sometimes entirely suppressed; corolla unknown 3. *C. falcata*.

Bracts lanceolate-acuminate; leaves 8 in. long, with one of each pair reduced to a subulate process; margins entire or sometimes crenate; calyx 2-fid; corolla 1.5 in. long .. 6. *C. pendula*.

Leaves of a pair always subequal:—

Margins of leaves serrate; calyx .5 in. long, 2-fid; corolla 1 in. long 4. *C. pilosa*.

Margins of leaves crenate; calyx 1.5 in. long, 3-fid; corolla 1.5 in. long 5. *C. lanceolata*.

Bracts connate in a large white cup; leaves of a pair always subequal 7. *C. cupulata*.

1. *CYRTANDRA DISPAR*, DC. Prodr. IX. 282 (1845). Shrub with a stout, pale, reticulate, fistular stem; obscurely 4-angled. *Leaves* alternate, obovate oblanceolate, inæquilateral, petioled; strongly toothed, especially at the apex; glabrous above, red-pubescent beneath; 12 in. long, 4 in. wide; petiole 1 in. long. *Flowers* small, very numerous, in axillary cymes; pedicels .25 in. long, hispid. *Calyx* persistent, cup-shaped, with 5 lanceolate, acuminate, hairy lobes. *Corolla* white, .5 in. long; tube dilated upwards, hairy outside; lobes short, obtuse, rounded. *Stamens* shorter than the tube; abortive ones very much reduced. *Pistil* hairy. *Berry* .25 in. long, oblong, ellipsoid, hairy. Miq. Fl. Ind. Bat. II. 742; Clarke in DC. Monog. Phan. V. i. 203, t. 23, and in Hook. f. Fl. Br. Ind. IV. 375; Ridley in Journ. Str. Br. R. As. Soc. No. 43, 88. *C. frutescens*, Wall. Cat. 807 partly, not of Jack.

PENANG: Government Hill, Curtis 1204; Wallich 807; (part);

Maingay (K.D.) 1232. PERAK: Bujong Malacca, *Ridley* 9703; Larut Hills, *Ridley* and *Fox*, *Scortechini* 367, 1231; *Wray* 2196; *King's Collector* 2052, 5131, 3891.—DISTRIBUTION. Sumatra.

2. *CYRTANDRA SUFFRUTICOSA*, *Ridley* in *Trans. Linn. Soc. Ser. 2, III.* 330 (1893). A large shrub, 4 ft. tall, with hollow 4-angled pale stems .25 in. thick. *Leaves* opposite, one of each pair often very much smaller alternately on one side or the other; lanceolate, abruptly acuminate, subfalcate, inæquilateral; edges entire; nerves conspicuous, about 12 pairs; glabrous when adult, young leaves and petioles red-pubescent; 7 to 9 in. long, 2.5 to 3 in. wide; petiole .5 to .75 in. long. *Peduncles* short and thick, axillary; bracts free, ovate acute, pubescent, 1 in. long, .5 in. across; flowers about 6 in a head, nearly sessile. *Calyx* deciduous; sepals linear. *Corolla* glabrous, over 1 in. long; base cylindrical, dilated upwards; lobes rounded, obtuse, white with brown streaks in the throat. *Anthers* large, elliptic. *Style* pubescent. *Berry* .75 in. long, sausage-shaped. *Ridley* in *Journ. Str. Br. R. As. Soc. No. 43, 89.*

PERAK: *Scortechini* 142; Gopeng, *King's Collector* 4720; Kota Bahru, *King's Collector* 569; Tupai, Larut, *Wray* 2845. JOHORE: Tenggara, *Fielding*; Pulau Tioman, *Ridley*. On rocks.

Ridley says it is nearly allied to a Bornean species, *C. oblongifolia*, *Clarke*, but much larger in all parts. It is generally found growing on rocks or (*King's Collector* 4720) from the top of a high tree. *Wray* describes the flowers as "white marked in the throat with dark claret; bracts green without, claret within; fruit light green, finely spotted, paler."

3. *CYRTANDRA FALCATA*, *Ridley* in *Journ. Str. Br. R. As. Soc. No. 43, 89* (1905). Epiphytic shrub, about 2 ft. tall; stem quadrangular, fistulose, pale. *Leaves* lanceolate acuminate, falcate; alternate, often with small opposite ones; glabrous when adult; narrowed at the base into the petiole; nerves about 10 pairs; 7 or 8 in. long, 1.5 in. wide; petiole 1 in. long, pubescent. *Cymes* axillary, .125 in. shortly peduncled; bracts broadly ovate, acute, pubescent, .5 in. long; flowers few, shortly pedicelled. *Fruit* fusiform, .5 in. long.

PERAK: *Wray* 2845; *Scortechini* 142. SELANGOR: woods round the Kuala Lumpur Caves, *Ridley* 8219.

Allied to *C. oblongifolia*, *Hook. f.*, and *C. suffruticosa*, *Ridley*, but the leaves are much narrower than those of the latter, and thinner and with more conspicuous nerves than those of the former.

4. *CYRTANDRA PILOSA*, *Blume Bijdr.* 770 (1826). Shrub with stout 4-angled hollow stems as much as .5 in. through, 3 ft. tall, upper parts pubescent. *Leaves* opposite, obovate, narrowed into a winged petiole; margins serrate; above more or less covered with pale hairs from a

swollen base, in old leaves often glabrescent, beneath covered with red hairs on the nerves; nerves prominent 10 to 12 pairs; 8 to 18 in. long, 3 to 4 in. wide. *Cymes* small, nearly sessile, axillary; bracts ovate or lanceolate acuminate, hairy, 1 in. long. *Calyx* tubular, hairy, .5 in. long, bifid. *Corolla* white, 1 in. long, silky-hairy; tube infundibuliform, stout; upper lobes oblong obtuse, lower two connate, shortly bifid, obtuse, punctate above. *Stamens* little longer than the tube; filaments glabrous; abortive stamens short. *Fruit* ovoid, conic, acute, brown, reticulate-tessellate, .5 to .75 in. long. G. Don Gen. Syst. IV. 661; DC. Prodr. IX. 282; Miq. Fl. Ind. Bat. II. 742; Zoll. Verz. Ind. Archip. 55; Clarke in DC. Monog. Phan. V. i. 231, and in Hook. f. Fl. Br. Ind. IV. 375; Ridley in Journ. Str. Br. R. As. Soc. No. 43, 90. *C. decurrens*, De Vriese Pl. Ind. Bat. Reinwdt. 14; Miq. l.c. 746; Clarke l.c. 231, 375.

PENANG: Penara Bukit, *Wallich* 807, on banks in forests. PERAK: Larut Hills, *Ridley* 2915; *Curtis* 2897; *Scortechini* 354, 270; *King's Collector* 5588. SELANGOR: Bukit Kutu, *Ridley* 7574, Bukit Hitam, Pahang Track, 8560, 8554. NEGRI SEMBILAN: Bukit Tanga, *Napier*; Bukit Sulu, *Cantley*. JOHORE: Gunong Panti, *Ridley*; Bukit Tanah Abang, *Kelsall*.—DISTRIB. Tenasserim to New Guinea. In rocky woods up to about 2000 ft. altitude.

Ridley says he is unable to separate specifically the forms described respectively under the names of *C. pilosa*, Bl., and *C. decurrens*, De Vr., at least as far as applies to the variety *Wallichii* of the latter. The main distinction seems to be in the amount of hairiness of the leaves, in which point the plant seems very variable.

5. CYRTANDRA LANCEOLATA, *Ridley* in Journ. Linn. Soc. XXXII. 527 (1895). *Stem* about 1 ft. tall, quadrangular, upper part pubescent, the base bare. *Leaves* oblanceolate acute, narrowed at the base, crenulate, almost entirely glabrous; 12 in. long, 4 in. wide. *Cymes* at the base of the stem below the leaves very shortly peduncled, lax, many-flowered; pedicels .75 in. long, hispid; bracts lanceolate, small, hispid. *Calyx* 1.5 in. long, tubular, hispid; lobes 3, linear-acuminate. *Corolla* 1.5 in. long, dilated above, pubescent, white, throat yellow. *Anthers* long, narrowed above. *Style* 1 in. long, pubescent; stigma bilobed; lobes oblong, linear. *Ridley* in Journ. Str. Br. R. As. Soc. No. 43, 91.

JOHORE: Gunong Panti, *Ridley*.

6. CYRTANDRA PENDULA, *Blume Bijdr.* 768 (1826). *Stem* 1 or 2 ft. tall. *Leaves* alternate, ovate cordate or lanceolate, entire or crenate; dark green and glabrous above, often barred with white and covered with reddish tomentum beneath; 8 in. long, 4 to 6 in. wide; petiole 3 to 6 in. long, opposite leaf in each internode reduced to a subulate process

Capitulum of 20 flowers on peduncles 4 in. long, decurved, appressed-hairy; bracts lanceolate, acuminate, hairy; flowers shortly pedicelled. *Calyx*-tube .5 in. long, thin, shortly bifid. *Corolla*-tube 1.5 in. long; base narrow, curved, ventricose upwards, cream-coloured or pale yellow, hairy; upper lip of two rounded lobes, lower of three broader oblong rounded ones, all creamy white or pale yellow with purple spots in the mouth and tube. *Stamens* 2, glabrous; filaments purplish, sinuate; anthers oblong, connivent. *Style* stout, white; stigma transversely oblong. *Fruit* sausage-shaped, .5 in. long. G. Don Gen. Syst. Dichl. Pl. IV. 660; DC. Prodr. IX. 281; Miq. Fl. Ind. Bat. II. 739; Hook. Ic. Pl. t. 736; Clarke in DC. Monog. Phan. V. i. 242; Ridley in Journ. Str. Br. R. As. Soc. No. 43, 91. *C. bicolor*, Jack in Trans. Linn. Soc. XIV. 27; DC. *l.c.*; Clarke in Hook. f. Fl. Br. Ind. IV. 375; Miq. *l.c.*

PERAK: Larút Hills, *Curtis* 2036; *Scortechini* 142 and 254; *Wray* 2845; Ulu Bera, *King's Collector* 10810. SELANGOR: Kuala Lumpur, Bukit Hitam, *Ridley*. SUNGAI UJONG: Bukit Sulu, *Cantley*. MALACCA: *Maingay*. PAHANG: Kuala Tembeling, *Ridley*. JOHORE: Gunong Panti, Pulau Tiunan. SINGAPORE: Bukit Timah, *Ridley* 2703; *King*.—
DISTRIB. Java and Sumatra.

7. CYRTANDRA CUPULATA, *Ridley* in Journ. Linn. Soc. XXXII. 527 (1895). A shrubby plant 2 or 3 ft. tall; stem terete or more or less 4-angled above, covered with red hair. *Leaves* opposite, equal, very variable, oblanceolate with an acuminate base, serrately toothed; scantily hairy above, more hairy beneath; petiole sometimes winged to the base, villous, 1 in. long; blade 12 in. long, 4 in. wide. *Peduncles* .5 in. long, axillary in pairs, villous; bracts connate in a white hairy cup 1 in. long; bracteoles short, lanceolate, acute, white; flowers numerous, opening singly, little longer than the bract. *Corolla* 1 in. long, curved, infundibuliform, 2-lipped, pubescent, white, yellow and brown in the mouth; lobes 5 subequal, ovate, obtuse. *Stamens* included, 2. *Pistil* short; ovary oblong, with a terminal tuft of hair; style short, curved; stigma clavate, bilobed. *Fruit* .5 in. long, fusiform. *Ridley* in Journ. Str. Br. R. As. Soc. No. 43, 92.

PERAK: Tapa, *Wray* 1389 and 191; Ulu' Bubong, *King's Collector* 10250; Larút Hills, *Scortechini* 366; Chanderiang, *King's Collector* 5833, in wet woods. MALACCA: lower slopes of Mount Ophir, *Ridley* 7575; Sungai Buluh, *Ridley* 10550. PAHANG: Tahan Woods, *Ridley* 2150.

Family XC.—VERBENACEÆ.

Herbs, shrubs or trees. *Leaves* opposite or verticillate (apparently alternate in *Geunsia*), simple, digitate or pinnate (*Peronema*); stipules none. *Inflorescence* cymose, racemose or spicate, often in panicles; bracts usually small, sometimes leafy; flowers hermaphrodite or sometimes polygamous, generally irregular, often brightly coloured, sometimes with coloured calyx or enlarged coloured involucre. *Calyx* inferior, gamosepalous, 5- to 4- (rarely 6- to 8-) lobed, often accrescent. *Corolla* gamopetalous; tube usually cylindric or dilated above, often curved; limb 2-lipped or subequally lobed; lobes 4 or 5, rarely more. *Stamens* usually 4 didynamous, sometimes 2, sometimes 5. 6 or more, inserted on the corolla-tube; filaments free; anthers 2-celled, opening longitudinally. *Ovary* superior, sessile, 2- to 4-celled, entire or 4-lobed; ovules variously attached, 2 (sometimes 1) in each cell; style terminal; stigma entire or bifid at apex. *Fruit* drupaceous with bony pyrenes, or capsular, 1- to 4-celled; mesocarp usually fleshy; endocarp usually bony. *Seeds* erect or pendulous, separate in distinct cells; albumen usually none; embryo straight; radicle inferior.—DISTRIB. Tropical regions of both hemispheres, very few extending to temperate countries; species about 750.

Inflorescence spicate, centripetal (the lowest flowers opening first) (Tribe I. VERBENÆ):—

Shrubs or herbs with short spikes; calyx minute; stamens 4; anther-cells parallel:—

Fruit a drupe with fleshy mesocarp 1. LANTANA.

Fruit dry with thin granular mesocarp 2. LIPPIA.

Herbs with long spikes; calyx long, tubular; stamens 2;

anther-cells divaricate 3. STACHYTARPHETA.

Inflorescence cymose, centrifugal (the end flowers opening first):—

Cymes paniculate; drupes fleshy (Tribe II. VITICEÆ):—

Leaves simple:—

Corolla regular; stamens isomerous, equal:—

Flowers 5-merous; drupe with 5 to 10 pyrenes .. 4. GEUNZIA.

Flowers 4-merous; drupe with 4 pyrenes .. 5. CALLICARPA.

Flowers 4- to 6-merous; drupe with 14-celled endocarp, included in the accrescent calyx .. 6. TECTONA.

Corolla 2-lipped; stamens didynamous:—

Drupe with 1 pyrene:—

Flowers small 7. PREMNA.

Flowers large 8. GMELINA.

Drupe with 4 pyrenes (1 to 3 often suppressed) .. 9. CLERODENDRON.

Leaves digitate or in 1 species unifoliolate; pyrene 1 .. 10. VITEX.

- Cymes paniculate ; drupes capsular (Tribe III. CARYOPTERIDÆ) :—
 Leaves impariprimate ; fruit 4-celled ; calyx not enlarged
 in fruit ; trees 11. PERONEMA.
 Leaves 1- to 3-foliolate ; fruit 2-celled ; calyx much
 enlarged in fruit ; climbers 12. PETREOVITEX.
- Cymes capitate ; bracts of the flower-head usually large
 and involucriform ; large climbers (Tribe IV. SYMPHOREMÆ) :—
 Involucral bracts 6 ; corolla-lobes subequal ; stamens
 included or exsert 13. SPHENODESMA.
 Involucral bracts 4 ; corolla 2-lipped, the two lobes of
 the upper lip the longest ; stamens exsert 14. CONGEA.
- Cymes densely capitate or in short spikes, centripetal ;
 flowers small ; calyx-segments 5, much imbricate ; trees or
 shrubs (Tribe V. AVICENNIEÆ) 15. AVICENNIA.

HOLMSKIÖLDIA SANGUINEA, Retz Obs. VI. 31 (1791), is a straggling shrub of the Eastern subtropical Himalaya, with a large red obconic calyx and red flowers, often cultivated in gardens and occasionally found as an escape.

PENANG : on Government Hill, *Curtis* 2879.

DURANTA PLUMIERI, Jacq. Select. Stirp. Amer. 186, t. 176, fig. 76 (1763), is a blue-flowered shrub cultivated in gardens and sometimes found run wild in their neighbourhood.

SINGAPORE : *Ridley*.

Tribe I. VERBENÆÆ.

1. LANTANA, Linn.

Erect or subscandent, often rambling, pubescent or scabrous shrubs, rarely herbs ; branches usually tetragonal, sometimes prickly. *Leaves* simple, opposite or ternate, petiolate, inciso-crenate, more or less rugose. *Flowers* in dense pedunculate spikes from the axils of the leaves, variable in colour ; the spikes capitate, ovoid or cylindrical ; bracts conspicuous, persistent, ovate or lanceolate ; bracteoles none. *Calyx* small, membranous, campanulate, truncate or 4- to 5-toothed. *Corolla* hypocrateriform ; tube slender, cylindrical ; lobes 4 to 5, spreading, orbicular. *Stamens* 4 didynamous, included in the corolla-tube and inserted at its middle ; anthers broadly oblong with parallel cells. *Ovary* 2-celled ; ovule solitary in each cell, erect from the base or laterally attached close to the base ; style short ; stigma oblique or sublateral, thickened. *Fruit* a drupe with more or less fleshy mesocarp ; endocarp hard, separating when ripe into two 1-celled, 1-seeded pyrenes. *Seed* exalbuminous ; testa reticulate ; radicle inferior.—
 DISTRIB. Species about 50, tropical or subtropical, mostly American, a few African or Asiatic.

Bracts lanceolate; without prickles	..	..	..	1. <i>L. salvifolia</i> .
Bracts ovate, acuminate; with recurved prickles	..	..	..	2. <i>L. aculeata</i> .

1. *LANTANA SALVIFOLIA*, Jacq. Hort. Schoenbr. III. 18, t. 285 (1798). An erect branching shrub, reaching 3 to 8 ft. in height; stems rough, without prickles; branchlets quadrangular, strigosely hispid, yellowish-brown. *Leaves* opposite or in whorls of 3, membranous when dry; ovate-lanceolate, acute at apex, suddenly narrowed and then decurrent at base; both surfaces rugose, the upper strigosely hispid, the lower villous and pale; margins crenate-serrate; 2 to 5 in. long, 1 to 2 in. broad; main nerves 8 to 12 pairs, the lowest pair opposite and more oblique than the others, all curving to the margin; reticulations prominent; petiole .2 to .4 in. long, winged by the decurrent margins of the blade. *Spikes* globose to oblong, .5 to 1 and even 1.5 in. long, gradually elongating as the fruit ripens; peduncles angular, hispid, 1 to 3 in. long; bracts ovate, caudate-acuminate, strigosely villous, .25 in. long. *Calyx* minute, truncate, densely villous. *Corolla*-tube curved, slightly inflated opposite the stamens, villous without, .2 in. long; lobes spreading, rounded, the uppermost slightly acute. *Filaments* short; anther-cells equal. *Drupe* oblong, purple; exocarp thin, hispid; mesocarp fleshy; endocarp rugose, the 2 pyriform pyrenes of which it is composed closely adherent. *Seed* elliptic; testa reticulate; cotyledons thin. Baker in Dyer Fl. Trop. Afr. V. 276; Schauer in DC. Prodr. XI. 605. *L. indica*, Roxb. Hort. Beng. 46 (1814), and Fl. Ind. III. 89; Wall. Cat. 1823 A,B; Wight Ill. t. 173 b, fig. 3, and Ic. t. 1464; Trimen Fl. Ceyl. III. 346; Clarke in Hook. f. Fl. Br. Ind. IV. 562; Cooke Fl. Bomb. II. 418; Prain Beng. Plants 825. *L. dubia*, Wall. Cat. 1821, 2 and c, not 1; Royle Ill. 300 t. 73, fig. 2. *L. collina*, Dene. in Jacquem. Voy. Bot. 136, t. 141. *L. alba*, Schauer l.c. 606; Dalz. & Gibs. Bomb. Fl. 198; Brandis For. Fl. 369; Kurz For. Fl. II. 253; Boiss. Fl. Orient. IV. 532, not of Miller, Dene. or Link.

PENANG: *Ridley*; *Curtis* 121; *Deschamps*. PERAK: at Teluk Anson, *Ridley* 10762. MALACCA: *Ridley* 10115. SINGAPORE: *Deschamps*; *Kunstler* 135.—DISTRIB. India, Burma, Ceylon, Tropical and South Africa.

2. *LANTANA ACULEATA*, Linn. Sp. Pl. 627 (1753). A very straggling erect shrub with many branches, 4 to 8 ft. high; branchlets quadrangular, armed with recurved prickles. *Leaves* opposite; ovate, acute at apex, truncate or cordate at base; the blade decurrent; upper surface scabrous, lower pubescent; margins crenate, 1 to 3 in. long, 1 to 2 in. broad; midrib slender; main nerves 5 to 6 pairs, curving upwards to the margin; reticulations netted; petiole slender, .5 to .7 in. long, the upper part bordered by the decurrent margins of the blade. *Spikes*

globose, .25 to 1 in. in diam. ; peduncles 1 to 1.5 in. long, hispid ; bracts lanceolate, .25 in. long ; flowers of various colours, orange, red, and white. *Calyx* very small, slightly 2-lipped, pubescent. *Corolla*-tube slender, pubescent, .2 to .4 in. long ; lobes rounded, spreading. *Filaments* very short ; anther-cells unequal. *Drupe* ovoid, black, shining, .1 to .2 in. in diam. ; pyrenes rounded. Bot. Mag. t. 96 ; Dalz. & Gibs. Suppl. 68 ; Trimen Fl. Ceyl. III. 346. *L. Camara*, Linn. *l.c.* ; Schauer in DC. Prodr. XI. 598 ; Hook. f. Fl. Br. Ind. IV. 562 ; Cooke Bomb. Fl. II. 419 ; Prain Beng. Plants 825 ; Baker in Dyer Fl. Trop. Afr. V. 275.

PENANG: *Curtis* ; *Deschamps*. PROVINCE WELLESLEY: *G. King*. SINGAPORE: *Deschamps*.—DISTRIB. Native of Tropical America, now widely spread in many regions of the Old World and very troublesome from its quick and strong matted growth.

2. LIPPIA, Linn.

Shrubs or undershrubs, rarely herbs, usually more or less hairy. *Leaves* opposite, ternate or verticillate, rarely alternate ; entire dentate or lobate. *Flowers* small, in elongate or cylindrical or capitulate spikes ; bracts small, imbricate ; bracteoles none. *Calyx* small, membranous, 2- to 4-lobed, ultimately 2-valved, enclosing or sometimes adhering to the fruit. *Corolla* more or less hypocateriform ; tube cylindrical, straight or curved ; limb oblique, more or less bilabiate ; upper lip bifid, emarginate or 2-lobed ; lower lip 3-lobed. *Stamens* 4 didynamous, included in the corolla-tube and inserted at its middle ; anthers ovate with parallel cells. *Ovary* 2-celled ; ovule solitary in each cell, erect from the base or laterally attached near the base of the cell ; style short ; stigma capitate, oblique or recurved, thickened. *Fruit* small, with a dry epicarp ; mesocarp granular ; endocarp hard, bony, easily separating into two 1-seeded pyrenes. *Seed* exalbuminous ; radicle inferior.—DISTRIB. About 100 or more species, chiefly Tropical American, with a few African and only very few Asiatic.

LIPPIA NODIFLORA, Michx. Fl. Bor. Amer. II. 15 (1803). A creeping perennial herb ; stems rooting at the nodes, much branched, sub-quadrangular, channelled, more or less clothed with appressed, medifixed, white hairs, often glabrous. *Leaves* opposite, subsessile, spatulate, rounded at apex, cuneate at base ; both surfaces appressedly hairy with medifixed white hairs ; upper half deeply and sharply serrate, lower entire ; .75 to 1.25 in. long, .25 to .75 in. broad ; midrib prominent ; main nerves 3 to 4 pairs, straight. *Spikes* dense, globose at first, afterwards gradually elongating to oblong in fruit, .25 to .5 in. long ; peduncles 1 to 3 in. long, usually from only one axil of each pair

of leaves, slender, quadrangular, channelled; bracts much imbricate, variable, .1 to .2 in. long, lower broadly ovate, upper narrowly cuneate, all acuminate with more or less hyaline fimbriate margins; flowers small, pale blue, pink, or white. *Calyx* 2-lobed; lobes lanceolate, pubescent. *Corolla*-tube slender, .1 in. long; limb 2-lipped, lower lip 3-lobed, midlobe obtuse. *Stigma* capitate. *Fruit* .05 to .075 in. long, glabrous, ovoid; epicarp bony, membranous; mesocarp granular; endocarp separating in two plano-convex pyrenes. *Seed* elliptic; testa membranous; cotyledons fleshy. Schauer in DC. Prodr. XI. 585; Wight Ill. t. 173 b, fig. 2, and Ic. t. 1463; Dalz. & Gibs. Bomb. Fl. 198; Clarke in Hook. f. Fl. Br. Ind. IV. 563; Miq. Fl. Ind. Bat. II. 905; Trimen Fl. Ceyl. III. 347; Cooke Bomb. Fl. II. 420; Prain Beng. Plants 825; Baker in Dyer Fl. Trop. Afr. V. 279. *Verbena nodiflora*, Linn. Sp. Pl. 20; Burm. Fl. Ind. 12, t. 6, fig. 1; Roxb. Hort. Beng. 4. *Blairia nodiflora*, Gaertn. Fruct. I. 266, t. 56. *Zapania nodiflora*, Lamk. Ill. t. 17; Wall. Cat. 1824. *Latana sarmentosa* and *repens*, Spreng. Syst. II. 752. *Phyla chinensis*, Lour. Fl. Cochinch. 66.

PENANG: at Sangie Penang, *Curtis* 3520. PROVINCE WELLESLEY: *Curtis* 2208. SINGAPORE: *Kunstler* 1198, in grassy and sandy places near the coast.—DISTRIB. India, Malay Archipelago, Africa and most tropical and subtropical regions.

3. STACHYTARPHETA, Vahl.

Herbs or shrubs. *Leaves* usually opposite, toothed, usually rugose. *Flowers* in terminal spikes in the axils of bracts, the rachis often hollowed out beneath each flower; bracts lanceolate, long or short; bracteoles none. *Calyx* elongate, narrowly cylindrical, shortly 4- to 5-toothed, variously slit at a late stage. *Corolla* hypocrateriform; tube slender, cylindrical, usually curved; limb spreading, 5-lobed; the lobes equal or unequal, rounded. *Stamens* 2 perfect (the anticous ones), included in the corolla-tube, affixed above the middle; filaments short; anther-cells vertically divaricate; staminodes (posticous) 2 or 0. *Ovary* 2-celled; ovules solitary in each cell, attached laterally near its base; style long, filiform, exsert; stigma capitate. *Fruit* cylindrical, included in the calyx, separating into 2 bony 1-seeded pyrenes. *Seeds* oblong; testa membranous; albumen none; cotyledons fleshy; radicle inferior.—DISTRIB. About 40 species, mostly Tropical American, a few African; the Indo-Malayan species probably introduced and run wild.

Spikes usually slender, glabrous; flowers blue 1. *S. jamaicensis*.
 Spikes usually stout, hairy; flowers pink 2. *S. mutabilis*.

1. STACHYTARPHETA JAMAICENSIS, Vahl Enum. I. 206 (1805). An

annual erect branched herb, reaching 1 to 3 ft. high; stems dichotomously branched, nearly quadrangular. *Leaves* opposite, elliptic, obtuse or acute at apex, cuneate at base and decurrent, upper two-thirds coarsely serrate, lower cuneate portion entire; both surfaces glabrous or nearly so; 1 to 4 in. long, 1 to 1.5 in. broad; midrib slender; main nerves slender, 4 to 6 pairs, curved upwards; petiole obscure, being winged by the decurrent margins of the blade. *Spikes* elongate, 3 to 12 in. long, slender; rachis up to .15 in. in diam., conspicuously excavated to hold the flowers, the hollows closed by the bracts; bracts lanceolate, acuminate, scarious and ciliate on the margins, .15 to 2 in. long; flowers blue. *Calyx* .25 in. long, membranous, glabrous, 4- to 5-toothed, usually slit on one side (that in the hollow of the rachis). *Corolla*-tube curved outwards, .3 to .5 in. long; limb spreading, 5-lobed. *Fruit* dry, .15 in. long, tipped with the slender remains of the style; pyrenes plano-convex, very hard. Bot. Mag. t. 1860. *S. indica*, Vahl, *l. c.*; Clarke in Hook. f. Fl. Br. Ind. IV. 564; Trimen Fl. Ceyl. III. 348; Cooke Bomb. Fl. II. 421; Prain Beng. Plants, 826; Baker in Dyer Fl. Trop. Afr. V. 284. *S. urticifolia*, Dalz. & Gibs. Bomb. Fl. Suppl. 68. *Stachytarpha jamaicensis*, Schauer in DC. Prodr. XI. 564. *S. indica*, Schauer in DC. *l. c.*; Miq. Fl. Ind. Bat. II. 907. *Verbena jamaicensis*, Linn. Sp. Pl. 19; Roxb. Hort. Beng. 4. *V. indica*, Linn. Sp. Pl. ed. 3, 27; Wall. Cat. 2656.

PENANG: common by roadsides, *G. King*; on Government Hill, *Curtis*. PERAK: at Panjsore, *Scortechini* 996. JOHORE: *Marius, Jensen*. SINGAPORE: *Cuning* 2406; in waste places, *Deschamps; Kunstler (King's Collector)* 173, 1149.—DISTRIB. India, Ceylon, Malay Archipelago, Tropical Asia and Africa; in Malaya probably introduced and run wild.

2. STACHYTARPHETA MUTABILIS, Vahl Enum. I. 209 (1805). A stout branching pubescent herb, reaching 3 ft. high or more; stems quadrangular, densely tawny-pubescent. *Leaves* opposite, ovate acute at apex, rounded at base and decurrent; upper three-fourths broadly crenate, the crenatures mucronate, basal part entire; upper surface sparsely villous and scabrid, lower softly grey-tomentose; 3 to 5 in. long, 1.5 to 2.5 in. broad; midrib stout; main nerves 6 to 8 pairs; petiole 1.5 to 1 in. long, almost entirely bordered by the decurrent margins of the blade. *Spikes* stout, elongate, 6 to 18 in. long; rachis up to .25 in. in diam., excavated vertically to hold the flowers, the hollows closed by the bracts; bracts ovate-lanceolate, cuspidate-acuminate, strigosely hairy, .25 to .5 in. long; flowers pink. *Calyx* .4 to .5 in. long, strigosely pubescent, 4-toothed on the outer side, cleft on the inner, the teeth acute. *Corolla*-tube curved outwards, up to 1 in. long, slightly

dilated at the throat; limb spreading, lobes 5 rounded. *Anther*-cells .05 in. long; filaments villous; staminodes subulate, villous, .15 to .2 in. long. *Fruit* oblong, ovoid or somewhat pyriform, tipped with the long remains of the style; pyrenes plano-convex, very hard, .2 to .25 in. long. *Seed* oblong, .15 in. long; testa membranous; cotyledons obovate, .1 in. long, fleshy. Schauer in DC. Prodr. XI. 565; Bot. Mag. t. 976; Cooke Bomb. Fl. II. 422; Baker in Dyer Fl. Trop. Afr. V. 284. *Verbena mutabilis*, Jacq. Coll. 2, 334; Icon. Rar. 2, 207; Andr. Bot. Rep. t. 435.

PENANG: Curtis 867; Birch; Ridley 7044. SINGAPORE: in waste places, *Deschamps*.—DISTRIB. A native of Tropical America, widely spread in the Old World, *e. g.*, Southern India, Java, Central Africa

Tribe II. VITICEÆ.

4. GEUNZIA, Blume.

Trees or large shrubs, stellately tomentose. *Leaves* opposite or occasionally alternate by the separation of the leaves of a pair, petiolate, entire. *Flowers* small, in many-flowered pedunculate cymes in the upper axils of the branchlets; bracts linear, small. *Calyx* campanulate, shortly 5- to 6-toothed. *Corolla* campanulate; tube exsert, funnel-shaped; lobes 5, spreading. *Stamens* 5 to 6; anthers oblong, exserted, glandular, dorsifixed; cells parallel, dehiscing longitudinally but more widely at tip; filaments slender. *Ovary* imperfectly 5-, rarely 4- to 3-celled; the cells 2-ovulate; the ovules fixed laterally above the middle of the cell; style exsert, stout; stigma 5- or less lobed, dilated. *Drupe* small, globose, depressed, on the persistent not enlarged calyx; exocarp thin; mesocarp granular; endocarp hard; pyrenes 5 to 10, equal in number to the ovules, 1-seeded. *Seeds* small, oblong-ovoid; testa thin; albumen none; cotyledons fleshy; radicle inferior.—DISTRIB. 3 to 4 species, of the Malay Peninsula and Archipelago.

GEUNZIA FARINOSA, Blume Bijdr. 819 (1826). A large tree, reaching 60 to 70 ft. in height and a considerable diameter; the upper branches, inflorescence, and under surface (also upper surface when young) of leaves covered more or less densely with stellate furfuraceous pale brown tomentum, and also often with minute rounded glands. *Leaves* coriaceous, ovate or elliptic-oblong, long cuspidate-acuminate at apex, rounded or subacute at base; upper surface when young farinose, later glabrous; lower surface rugose; margin entire or minutely denticulate, 5 to 9 in. long, 2 to 4 in. broad; midrib prominent; main nerves 10 to

12 pairs obliquely curved upwards and joined by many more or less parallel transverse nerves; reticulations close; petiole stout, 1 in. long, channelled above, the opposite ones joined by a raised line. *Cymes* rounded, dichotomously branched, 1.5 to 2 in. broad; peduncles 1 to 1.5 in. long; bracts subulate, .15 to .2 in. long; pedicels very short; flowers reddish-purple. *Calyx* .06 in. deep, glabrous within. *Corolla*-tube .1 to .2 in. long, glandular; lobes recurved, .05 in. long, rounded. *Stamens* exerted; filaments a little longer than the corolla-tube; anthers .1 in. long, very glandular on the back. *Drupe* reddish-black when ripe, .15 in. broad, .1 in. in diam., top depressed. Clarke in Hook. f. Fl. Br. Ind. IV. 566; Bocquillon Revis. Verben. 89, t. 8; Koord. & Valetton Bijdr. VII. 173. *G. Cumingiana*, Rolfe in Journ. Linn. Soc. XXI. 315. *Callicarpa pentandra*, Roxb. Fl. Ind. I. 395; Wall. Cat. 1836; Schauer in DC. Prodr. XI. 646; Miq. Fl. Ind. Bat. II. 885. *C. acuminatissima*, Teysm. & Binn. in Batav. Nat. Tijdschr. XXV. 409. *C. Cumingiana*, Schauer, l. c. 644.

KEDAH: on Langkawi Island, *Curtis* 2552. PERAK: *King's Collector* 859, 972 (*part*), 5731, 8547. SELANGOR: at Batu Tiga, *Curtis* 3767; at Ginting Bidai, *Ridley* 7599; at Rawang, *Ridley* 10494. SINGAPORE: *Wallich* 1836.—DISTRIB. Java (*Forbes* 315, 375, 539, 602; *Kollman*; *Koorders* 15204B), Borneo (*Beccari* 786; *Haviland* 554, 1343, 3553; *Motley* 385), Amboina, Philippine Islands, &c.

The following Bornean species seems to be undescribed:—

GEUNSA HAVILANDII, King & Gamble in Kew Bull. 105 (1908). A tree (?); branches, inflorescence, and under surface of leaves densely tawny-stellate-pubescent and strigosely hairy. *Leaves* opposite, ovate or ovate-oblong, shortly acuminate and mucronate at apex, acute or cuneate at base; upper surface strigosely scabrous-hispid on the upper surface, especially on the midrib; lower surface rugose, stellate-pubescent and studded with peltate glands; margins rather distinctly denticulate; 2.5 to 6 in. long, 1.5 to 2.5 in. broad; midrib stout, prominent; main nerves 9 to 11 pairs, prominent beneath, gently curving upwards to anastomose near the margin, joined by conspicuous transverse nervelets; reticulations netted; petiole stout, tawny-hispid, .5 to .75 in. long. *Cymes* axillary, few-flowered, subsessile, scarcely longer than the petiole; bracts very small, subulate; pedicels slender, short. *Calyx* campanulate, glabrous within, without very strigosely hispid; teeth 5, minute in bud, afterwards elongating to .05 in. long. *Corolla* campanulate, nearly glabrous except for peltate shining glands; tube .1 in. long; lobes 5, ovate, rounded, about .075 in. long, recurved in flower. *Stamens* exerted; filaments slender, glabrous; anthers .1 in. long, oblong, prominently yellow-glandular on the back. *Ovary* thickly glandular, depressed; style slender, .2 in. long; stigma shortly 5-lobed. *Drupe* reddish-black when dry, .15 in. in diam., top depressed, dividing into 5 pyrenes; fruiting calyx flattened.

BORNEO: at Sarawak, *Beccari* 3240; *Haviland* 3549 K and L; near Kuching, *Haviland* 889.

We are a little in doubt whether this is the *G. Beccariana*, Briquet in Engl. & Prantl Nat. Pflanzenfam. IV. 3 and 165, of which we can find no description. We think, however, that Briquet's *G. Beccariana* is Beccari 2759, a beautiful species from Sarawak with long tawny hair.

5. CALLICARPA, Linn.

Trees or shrubs, more or less clothed with stellate or farinose tomentum, with or without glandular scales, rarely quite glabrous. *Leaves* opposite, rarely ternately whorled; crenulate serrulate or rarely entire, in one species lobed. *Flowers* small, white red or purple, in axillary sessile or pedunculate, usually many-flowered, cymes; bracts linear, inconspicuous. *Calyx* very small, shortly campanulate, truncate or minutely 4-lobed, unaltered in fruit. *Corolla* small, campanulate or tubular; tube twice as long as the calyx or less; lobes 4, oblong, erect or spreading. *Stamens* 4 equal, inserted at about the middle of the tube or lower, sometimes at the base; filaments slender, exsert; anthers ovate or oblong, dorsifixed; the cells parallel, both sides usually prominently glandular. *Ovary* imperfectly 2-celled; cells 2-ovuled; style elongate; stigma dilated, shortly and obscurely bifid; ovules attached at the middle of the cell or higher. *Fruit* a small globose drupe, supported by the persistent calyx; exocarp thin; mesocarp fleshy; endocarp bony, of 4 or fewer pyrenes, convex on the back, flattened on the sides. *Seeds* small, oblong; testa membranous; albumen none or evanescent; cotyledons fleshy; radicle inferior.—**DISTRIB.** About 30 species, of Tropical and Subtropical Asia, to Japan, Australia and Polynesia; also in Central America and the West Indies.

Lower surface of leaves covered with dense stellate tomentum, without or with very few glandular dots; margins of leaves entire or nearly so:—

Leaves broad, more or less elliptic; cymes long, many-flowered:—

Leaves long-acuminate, tomentum thick; cymes dense;

corolla-tube only about .075 in. long, merely puberulous

1. *C. arborea.*

Leaves obtuse or very shortly acuminate, tomentum thin;

cymes spreading; corolla-tube .1 in. long, stellate-pubescent

2. *C. Maingayi.*

Leaves narrow, lanceolate; cymes short, few-flowered; corolla-

tube .15 in. long, stellate-pubescent

3. *C. angustifolia.*

Lower surface of leaves densely grey stellate-flocculose, with many glandular dots on both surfaces; margins of leaves serrate:—

Cymes spreading, reaching 3 to 4 in. in diam.; upper surface of leaves glabrate, lower densely grey-flocculose

4. *C. Reevesii.*

Cymes dense, rounded, rarely 1 to 2 in. in diam.:—

Upper surface of leaves glabrate, lower whitish-grey,

stellately tomentose

5. *C. cana.*

Upper surface of leaves hispid-puberulous, lower thinly grey-stellate-tomentose	6. <i>C. pedunculata</i> .
Lower surface of leaves sparsely stellate hairy, with many glandular dots; margins of leaves serrulate; cymes rounded, up to 2 in. broad	7. <i>C. longifolia</i> .

1. *CALLICARPA ARBOREA*, Roxb. Hort. Beng. 10 (1814), and Fl. Ind. I. 390 (1832). A tree reaching 40 ft. in height, with thick trunk and round head; branches stout; branchlets thick, obtusely quadrangular, covered with dense grey-tawny, forked, stellate or mealy tomentum, as are the young leaves and inflorescence. *Leaves* coriaceous; ovate or elliptic-ovate, acuminate at apex, long acute or cuneate at base; upper surface when young with mealy soft stellate-tomentum, afterwards glabrous, lower closely tawny-stellate tomentose; margins entire or sometimes distantly denticulate; 6 to 12 in. long, 2 to 5 in. broad; midrib very stout, much raised beneath; main nerves stout, 8 to 14 pairs, raised beneath and joined by fairly regular transverse raised nervules, the main nerves starting at an angle of about 55° with the midrib and curving gently to the margin, where they anastomose; petiole stout, 1 to 2.5 in. long, channelled above. *Cymes* very many-flowered, widely dichotomously branched many times, reaching 6 in. in length and about 5 in. in breadth; peduncles 1 to 3 in. long; bracts linear-subulate, .25 in. long or less; pedicels very short; flowers red or purple. *Calyx* .05 in. long, truncate and minutely 4-toothed at mouth, glabrous within. *Corolla*-tube .075 in. long, puberulous without; lobes 4, reflexed, subquadrate, as long as tube, villous without. *Stamens* long, exsert; anthers glandular-punctate on the back. *Ovary* villous; style much exsert, bent outwards, enlarged upwards; stigma peltate at first, then broadly funnel-shaped. *Drupe* .15 to .2 in. in diam., succulent, purple, ultimately black; pyrenes 4 or less. Wall. Cat. 1826 chiefly. Schauer in DC. Prodr. XI. 641; Brandis For. Fl. 368; Kurz For. Fl. II. 274; Clarke in Hook. f. Fl. Br. Ind. IV. 567; Prain Beng. Plants 827. *C. tectonæfolia*, Wall. Cat. 1827.

KEDAH: at Campong Yan, Ridley 5607. PENANG: Tanjong Bunga, Curtis 699; Batu Gaja jungles, Deschamps. PERAK: Wray 1824, 3957; at Bruas Dindings, Ridley 7179; Scortechini; King's Collector 972 (part).—
DISTRIB. India (Kumaon to Assam, Sonthal Parganas. Chota Nagpore, Eastern Bengal), Burma, Sumatra (Teysmann 4388; Forbes 1530, 2601).

VAR. *villosa*, Roxb. Hort. Beng. 10 (species). *Leaves* 6 to 8 in. long, 3.5 to 4.5 in. broad, ovate, caudate-acuminate at apex, rounded and then slightly decurrent at base. Tomentum of branchlets, young leaves, and inflorescence very thick and pale, chiefly consisting of

branched hairs. This var. resembles *C. lanata*, Linn., of Southern India and Ceylon in its leaves, but the flowers are those of *C. arborea*.

PERAK: *Scortechini*.

2. *CALLICARPA MAINGAYI*, King & Gamble in Kew Bull. 106 (1908). A tree; young branches, inflorescence, and leaves beneath covered with minute golden-brown stellate tomentum; branchlets stout, obtusely quadrangular. *Leaves* coriaceous, elliptic or elliptic-obovate, rounded and very shortly acute or acuminate at apex, rounded and then somewhat cuneate at base, the two sides often unequal; upper surface glabrous except the midrib and main nerves of young leaves; lower surface rugose and very minutely appressed stellate-pubescent; margins entire or undulate with minute denticulations at the ends of the nerves; 6 to 12 in. long, 3 to 6 in. broad; nerves all impressed on the upper surface, sharply and strongly raised on the lower; the midrib stout; main nerves 10 to 12 pairs, starting at about 75° with the midrib and curving upwards to anastomose near the margin, the pairs joined by fairly regular transverse nervules, and these again by the netted reticulations; petiole 1·5 to 2 in. long, stout, channelled above. *Cymes* many-flowered, rounded, reaching 3·5 in. long and 6 in. broad, widely dichotomous; peduncle stout, flattened, 1 to 1·5 in. long, further branch-peduncles also flattened when dry; bracts linear-subulate, very small; pedicels ·05 to ·1 in. long, slender. *Calyx* hemispherical, ·05 in. long, tawny stellate-pubescent without, glabrous within, with 4 minute teeth. *Corolla*-tube nearly cylindrical, ·1 in. long, densely and closely grey-stellate-tomentose without, nearly glabrous within; lobes short, rounded, erect or slightly recurved, ·04 in. long, villous within. *Stamens* inserted at ·04 in. from base of tube; filaments ·175 in. long; anthers oblong, ·075 in. long, glandular-punctate on the back. *Ovary* villous; style slender, bent; stigma broad, peltate. *Drupe* small, black, ·06 in. in diam. (immature).

SELANGOR: *Ridley* 2787. MALACCA: *Maingay* (K.D.) 1192; at Hulu Chembong, *Derry* 1005, Vern. "*Tampang Besi*."

In Kew Herbarium, *Maingay*'s specimen has been placed under *C. arborea*, but the species differs in many respects. The venation of the leaves is very different, as is the tomentum of much smaller stellate hairs; the leaves are nearly blunt; the tube of the corolla much longer, and its lobes much shorter; and we have no hesitation in describing it as a new species.

3. *CALLICARPA ANGUSTIFOLIA*, King & Gamble in Kew Bull. 106 (1908). A shrub, reaching 8 to 9 ft. in height; branchlets, inflorescence, and leaves beneath (also young ones above) clothed with appressed grey or ferruginous stellate tomentum; branchlets obscurely quadran-

gular. *Leaves* subcoriaceous; lanceolate, attenuately acute at apex, long attenuate at base and decurrent; upper surface dark, glabrous except when young; lower densely tomentose, grey-tawny or silvery; margins entire or rarely obscurely denticulate, slightly recurved; 4 to 7 in. long, .75 to 1.5 in. broad; midrib stout, impressed above, prominent beneath; main nerves 9 to 15 pairs, rather irregular, starting at from 60° to 70° with the midrib and at once curving upwards to and along the margin, joined by subparallel transverse nervules; petiole .5 to .75 in. long, the bases of the opposite leaves joined by a well-marked ridge. *Cymes* few-flowered, .5 to .75 in. long and about .75 in. broad, widely dichotomous; peduncles .25 to .35 in. long; bracts linear-subulate; pedicels very short, jointed; flowers bluish-pink. *Calyx* campanulate, .075 in. long, densely stellate-tomentose without, glabrous within; teeth mucronulate. *Corolla* about twice as long as calyx, densely stellate-tomentose without, glabrous within; lobes rounded, erect. *Stamens* inserted at or very near the base of the corolla-tube; filaments slender, .15 in. long, scarcely or not exsert; anthers .06 in. long, oblong, much glandular-dotted on both sides. *Ovary* villous; style slender, exsert; stigma capitate. *Drupe* glabrous, globose, .1 in. in diam., dark blue when ripe; pyrenes 4.

KEDAH: on Langkawi Island, *Ridley* 8330. PERAK: at Ipoh, *Curtis* 3197; at Batu Kuran, *Scortechini* 1596; on the top of limestone hills 600 to 1000 ft., *King's Collector* 7036, 8236.

The Kedah specimens have narrower leaves than the rest, with more slender branchlets. The species comes near to *C. angusta*, Schauer, from the Philippines, but differs in the almost quite entire leaves and larger flowers and fruit.

4. *CALLICARPA REEVESII*, Wall. Cat. 1830 (1828). A shrub; the branches, petioles, under surface of leaves, and inflorescence covered with a soft, whitish-grey or pale tawny, mealy tomentum of branched or stellate hairs. *Leaves* coriaceous; lanceolate or elliptic-lanceolate, long acute at apex, attenuate at base and often slightly unequal, not decurrent; upper surface dark when dry, glabrous except the nerves, lower tomentose; margins entire for the lower third, above that shortly dentate-serrate; 5 to 8 in. long, 2 to 3 in. broad; midrib stout; main nerves 13 to 15 pairs, nearly regular, starting at an angle of 45° to 60° with the midrib and curving gently to the margin, each pair joined by rather obscure transverse nervelets, all slightly impressed above; petiole .75 in. long. *Cymes* axillary, rounded, many-flowered, widely dichotomous, reaching 4 in. long and about 3 in. broad; peduncles 1.5 to 2 in. long; bracts linear subulate, .1 in. long; pedicels short, slender, nearly glabrous, .05 to .1 in. long; flowers purple? *Calyx* very

short, nearly glabrous but with a few stellate hairs and minutely glandular-punctate, very shortly 4-toothed. *Corolla* twice as long as calyx, .1 in.; lobes rounded, sparsely stellate-pubescent and glandular-punctate. *Stamens* long exsert; filaments slender; anthers small; the connective glandular-punctate. *Ovary* rounded, very glandular; style very long, twisted; stigma peltate, large. *Drupe* purple, small, .075 to .1 in. in diam., nearly globose; pyrenes 4. Schauer in DC. Prodr. XI. 641; Benth. Fl. Hongk. 270; Clarke in Hook. f. Fl. Br. Ind. IV. 568. *C. nudiflora*, Hook. and Arn. Bot. Beech. Voy. 206, t. 46.

SINGAPORE: near the Botanic Gardens, Murton 87; Ridley 6884 cult.!—DISTRIB. Tenasserim (?) (*Falconer*); Southern China.

5. *CALLICARPA CANA*, Linn. Mant. 198 (1771). A shrub; branchlets, leaves beneath, and inflorescence covered with a down of whitish or grey or cinnamomeous stellate hairs; branchlets obtusely quadrangular. *Leaves* membranous; ovate, ovate-elliptic or ovate-lanceolate, shortly acuminate at apex, cuneately attenuate at base; upper surface stellate-tomentose when young, afterwards glabrous, shining and dark-coloured, glandular-punctate; lower more or less whitish-grey stellate-tomentose, sometimes glabrescent, sometimes rugose, but more usually softly and conspicuously hairy, glandular-punctate beneath the tomentum; margins glandular-serrate, except at the cuneate base; 4 to 7 in. long, 2 to 3 in. broad; midrib rather slender, pubescent above; main nerves 10 to 12 pairs, impressed above, slightly raised beneath, starting at an angle of 40° to 45° with the midrib and curving upwards to the margin, joined by regular transverse nearly parallel nervules; reticulations netted, impressed above; petiole .25 to .75 in. long, upper part bordered by the decurrent margins of the blade. *Cymes* many-flowered, rounded, scarcely longer than the petioles, dichotomous; peduncles about .25 in. long; bracts linear-subulate, very small; pedicels very short; flowers pale-red. *Calyx* densely white-stellate-tomentose without, glabrous within, .05 in. long; teeth very minute. *Corolla* campanulate; tube glabrous, .075 in. long; lobes rounded, .025 in. long, slightly white-villous without. *Stamens* inserted close to the base of the tube; filaments much exsert, twisted, .15 in. long; anthers .02 in. long; the connective glandular-punctate. *Ovary* somewhat depressed; style decurved, often twisted, as long as filaments; stigma funnel-shaped. *Drupe* globose, under .1 in. long in diam., purple; pyrenes 4. Vahl Symb. III. 12; Roxb. Fl. Ind. I. 392; Wall. Cat. 1834; Blume Bijdr. 817; Dene in Nouv. Ann. Mus. III. 401; Schauer in DC. Prodr. XI. 643; Miq. Fl. Ind. Bat. II. 885; Benth. Fl. Austral. V. 56; Clarke in Hook. f. Fl. Br. Ind. IV. 568. *C. tomentosa*, Lamk. Dict. I. 562. *C. americana*, Lour. Fl. Cochinch. 70, not of Linn. *C. adenanthera*, Br. Prodr. 513.

C. Heynei, Roth Nov. Sp. 82; Blume Bijdr. 819. *C. bicolor*, Juss. in Ann. Mus. VII. 77; Schauer in DC. l. c. 642. *C. sumatrana*, Miq. l. c. 886. *C. dentata*, Herb. Roxb., Wall. Cat. 1834, *not of* Roth.

PENANG: Wallich 1834; Porter; Phillips. NEGRI SEMBILAN: Port Dickson, Sungei Ujong, Ridley 9574. MALACCA: Maingay (K.D.) 1190; Griffith; Ridley 1589. SINGAPORE: Kurz 2908.—DISTRIB. Malay Archipelago, Philippine Islands, Australia.

Clarke in Fl. Br. Ind. does not quote Bot. Mag. 2107, which Bentham had said probably represented a much more woolly plant, though it might be a var. of *cana*. With this we agree.

6. *CALLICARPA PEDUNCULATA*, Br. Prodr. Fl. Nov.-Holl. 513 (1810). A shrub with rather loose tomentum; branchlets stellate-pubescent. *Leaves* membranous; ovate, cuspidate-acuminate at apex, rounded at base; upper surface hispid-puberulous above, especially on the nerves, lower surface thinly whitish-grey stellate-tomentose; margins serrulate on the upper two-thirds; 3 to 6 in. long, 1.5 to 3 in. broad; midrib slender, main nerves about 10 pairs, curving gently upwards to the margin; transverse nervules many and rather prominent; petiole .25 to .5 in. long. *Cymes* rather dense, globose, stellately woolly, on peduncles .25 to .75 in. long; bracts and bracteoles linear subulate; pedicels extremely short. *Calyx* campanulate, about .03 in. long, stellate-pubescent and glandular; teeth short, thick. *Corolla* funnel-shaped, .125 in. long; tube nearly glabrous; teeth rounded puberulous within. *Stamens* inserted at the base of the tube; filaments long exsert, slender; anthers elliptic-reniform, the connective prominently gland-dotted. *Ovary* rounded, glabrous, glandular; style very long; stigma thick, capitate. *Drupe* dark purple, globose, .1 in. in diam.; exocarp smooth. Benth. Fl. Austral. V. 57; Clarke in Hook. f. Fl. Br. Ind. IV. 569. *C. cuspidata*, Roxb. Fl. Ind. I. 394. *C. dentata*, Roth Nov. Sp. 81; Blume Bijdr. 818; Wall. Cat. 6319. *C. cana*, Wall. Cat. 1834, No. 2. *C. lanata*, Schauer in DC. Prodr. XI. 644, *not of* Linn. or of Vahl. *C. tiliifolia*, Teysm. & Binn. *vide* Kurz MS.

PENANG: Wallich 1834, 2, 6319.—DISTRIB. Malay Archipelago, Tropical Australia.

7. *CALLICARPA LONGIFOLIA*, Lamk. Dict. I. 563 (1785), and III. t. 69 (1791). A shrub, reaching 5 to 6 ft. in height; branchlets, inflorescence, and leaves beneath rather sparsely covered with a short grey or tawny tomentum of stellate hairs; branchlets obtusely quadrangular, slender. *Leaves* membranous; lanceolate, ovate-lanceolate or occasionally oblong-lanceolate, long acuminate at apex, acuminately narrowed at base or rarely almost rounded; upper surface nearly glabrous, lower also some-

times glabrescent, more usually sparsely stellate-hairy; both surfaces gland-dotted; margins serrulate except near the base; 3 to 7 in. long, 1.5 to 3 in. broad; midrib slender but prominent beneath; main nerves 10 to 12 pairs, starting at an angle of 50° to 60° with the midrib and curving upwards to and along the margin, joined by regular parallel transverse nervelets, all nerves and midrib more or less pubescent; petiole .5 to 1 in. long, slender. *Cymes* dichotomously divaricate-branched, rounded, 1 to 1.5 in. long, and up to 2 in. broad; peduncles .35 to .5 in. long; bracts linear-subulate; pedicels slender, short, glabrescent in fruit; flowers pale blue, purplish, pink or white (Benth. in Fl. Austral.). *Calyx* campanulate, .05 in. long, glandular-dotted and sparsely stellate-hairy; teeth 4, mucronulate. *Corolla* nearly twice as long as calyx, pubescent without, glabrous within; lobes rounded, erect or incurved, about .025 in. long. *Stamens* inserted at the very base of the tube; filaments long exsert, slender, twisted; anthers ovate-orbicular; the connective prominently gland-dotted. *Ovary* villous; style long, curved, often deflexed; stigma funnel-shaped. *Drupe* white, depressed, glandular, .05 to .07 in. in diam.; pyrenes 4. Bot. Reg. t. 864; Roxb. Fl. Ind. I. 394; Brandis For. Fl. 369; Kurz For. Fl. II. 275; Schauer in DC. Prodr. XI. 645, Var. β *floccosa*; Benth. Fl. Austral. V. 57; Miq. Fl. Ind. Bat. II. 887; Koord. & Val. Bijdr. I. 176; Clarke in Fl. Br. Ind. IV. 570. *C. Roxburghiana*, Roem & Sch. Syst. III. Mant. 54. *C. attenuata*, Wall. Cat. 1835. *C. cana*, Wall. Cat. 1834 (*partly*). *C. dentata*, Wall. Cat. 6319 (*partly*).

KEDAH: on Langkawi Island, *Curtis* 2134. PENANG (OR SINGAPORE): *Wallich* 1835. PENANG: at waterfall and half-way up hill, *G. King*; *Stoliczka*. PERAK: *Scortechini* 1214; *King's Collector (Kunstler)* 80, 239. MALACCA: *Griffith* (K.D.) 6039; *Maingay* (K.D.) 1191. SELANGOR: *Curtis*. JOHORE: at Jaffaria, *G. King*. SINGAPORE: *Lobb*; *Hullett*; *Cantley* 120; *Schomburgk* 54; *G. Thomson* 44; *Walker* 207; *Deschamps* (cult.).—DISTRIB. Java, Sumatra, Borneo, to North Australia.

6. TECTONA, Linn. f.

Trees, stellately tomentose. *Leaves* opposite or whorled, large, entire, petioled. *Flowers* in dichotomous many-flowered cymes, in large terminal panicles; bracts small, narrow. *Calyx* campanulate, shortly 5- to 6-lobed, enlarged and becoming bladder-like in fruit and then ovoid or urceolate. *Corolla* small, white or bluish; tube short; limb with 5 to 6 short subequal spreading imbricate lobes. *Stamens* 5 to 6, attached near the base of the corolla-tube, equal, exserted;

anthers ovate or oblong with distinct parallel cells. *Ovary* fleshy, 4-celled; each cell 1-ovuled, ovules attached near their bases to the axis; style linear; stigma shortly bifid. *Fruit* a drupe enclosed in the accrescent calyx; exocarp spongy-suberose or almost none; endocarp bony, thick, 4-celled. *Seeds* erect, oblong; testa membranous; albumen 0; cotyledons fleshy and oily; radicle short, inferior.—DISTRIB. Species 3, one in India and Malaya, one in Burma, the third in the Philippine Islands.

TECTONA GRANDIS, Linn. f. Suppl. 151 (1781). A large deciduous tree; branchlets quadrangular, channelled, stellately tomentose, as are the young leaves, leaves beneath and inflorescence. *Leaves* coriaceous-chartaceous; ovate elliptic or obovate, acute or shortly acuminate at apex, rounded acute or cuneate often decurrent at base; upper surface stellate-tomentose when young, afterwards glabrescent, scabrous and punctate with round whitish glands, lower with grey or tawny stellate tomentum; margins entire; 1 to 2 ft. long, 6 in. to 1 ft. broad (leaves of seedlings and coppice shoots often much larger); midrib very stout, much raised beneath; main nerves 8 to 12 pairs, branched and curving upwards, joined by numerous prominent parallel transverse nervules; petiole .5 to 1.5 in. long, very stout, rounded below, the bases of opposite petioles joined by a prominent ridge. *Panicles* 1 to 3 ft. in length and breadth, much spreading, 2- to 3-chotomous; ultimate branches with a sessile fertile flower in the angle; peduncles quadrangular, 0 to 3 in. long; bracts lanceolate or spatulate, lower ones leafy, in pairs at the forks; pedicels very short; flowers white. *Calyx* in flower globose-campanulate, .125 in. long; lobes 5 or 6, .05 in. long, acute; calyx in fruit ovoid, ventricose, reticulate, often 1 to 1.5 in. in diam., with small teeth nearly closing the orifice. *Corolla* white, glabrous, 5 to 6-lobed; tube about .1 in. long; limb spreading; lobes subequal. *Ovary* densely hairy. *Drupe* subglobose, .5 to .75 in. in diam., indistinctly 4-lobed; pericarp soft, with dense felted stellate or branched hairs; endocarp thick, bony. *Seeds* obovoid; testa thin; cotyledons conform with the seed, fleshy; radicle very small. Gaertn. Fruct. I. 275, t. 57; Roxb. Cor. Pl. I. 10, t. 6, and Fl. Ind. I. 600; Wall. Cat. 772; Schauer in DC. Prodr. XI. 622; Dalz. & Gibs. Bomb. Fl. 199; Bocq. Rev. Verb. 99, t. 10; Bedd. Fl. Sylv. Madr. t. 250; Brandis For. Fl. 354, t. 44; Kurz, For. Fl. II. 259; Bl. Bijdr. 820; Miq. Fl. Ind. Bat. II. 901; Clarke in Hook. f. Fl. Br. Ind. IV. 570; Cooke, Fl. Bomb. II. 424; Prain Beng. Plants, 828; Koord. & Val. Bijdr. VII. 165; Briquet in Engl. & Prantl Nat. Pflanzenfam. IV. 3A, 167, t. 63. "*Theka*," Rheede Hort. Mal. IV. 57, t. 27; Rumph. Herb. Amb. III. t. 18.

MALAY PENINSULA: Burma to Malacca, *vide* Fl. Br. Ind. &c.—
DISTRIB. India, Burma, Siam, Sumatra, Java. The teak-tree, often cultivated (MALACCA: *Maingay*, (K.D.) 1193).

We include here the teak-tree, on the authority of the Fl. Br. Ind., but there are no specimens from the Malay Peninsula, from wild trees, in either of the herbaria of Kew or Calcutta. Mr. Ridley informs us that, so far as he is aware, the teak-tree is nowhere indigenous in the Malay Peninsula.

7. PREMNA, Linn.

Trees or shrubs, sometimes climbing. *Leaves* opposite or sometimes in whorls of 4, entire or toothed. *Flowers* in corymbose or paniced or sometimes thyrsoïd, pubescent, terminal cymes; bracts small, narrow; bracteoles 0. *Calyx* small, campanulate, truncate, 2-lipped or shortly 2- to 5-toothed. *Corolla* small; tube short, often villous within; limb 2-lipped, 5-lobed or subequally 4-lobed. *Stamens* 4 didynamous, inserted below the throat of the corolla-tube, rarely exerted; anthers ovate or rounded, the cells parallel or divergent. *Ovary* 2- or 4-celled, 4-ovuled; style linear; stigma shortly bifid. *Fruit* a small drupe, surrounded below by the calyx, globose or obovoid; mesocarp thin, fleshy; endocarp of 1 pyrene, hard, undivided, 4-celled or by abortion 1- to 3-celled, with a central cavity. *Seeds* oblong; testa thin; albumen 0; cotyledons flat; radicle inferior.—
DISTRIB. Species 40 or more, in the warmer regions of the Old World.

Calyx clearly 2-lipped:—

Upper lip of calyx 3-lobed; lower 2-lobed:—

- | | | | | | | |
|---|----|----|----|----|----|---|
| Leaves prominently crenate-dentate, ovate or ovate-deltoid, cordate | .. | .. | .. | .. | .. | 1. <i>P. littoralis</i> . |
| Leaves entire or very obscurely and distantly toothed, ovate | | | | | | 2. <i>P. flavescens</i>
var. <i>rubens</i> . |

Upper lip of calyx 2-lobed:—

Lower lip of calyx entire or obscurely lobed; corolla-tube funnel-shaped:—

- | | | | | | | |
|--|----|----|----|----|----|--|
| Cymes in panicles of interrupted spikes; leaves subsessile | | | | | | 3. <i>P. Derryana</i> . |
| Cymes in corymbose panicles; leaves petioled:— | | | | | | |
| Corymbs small, under 2 in. in diam.; leaves under 3·5 in. long | .. | .. | .. | .. | .. | 4. <i>P. integrifolia</i>
var. <i>angustior</i> . |

Corymbs rather large, reaching 5 in. in diam.; leaves over 3 in. long.

Corymbs lax:—

- | | | | | | | |
|--|----|----|----|----|----|-----------------------|
| Main nerves of leaves 6 to 8 pairs; leaves acuminate at apex, truncate or cordate at base; calyx-tube puberulous | .. | .. | .. | .. | .. | 5. <i>P. fatida</i> . |
|--|----|----|----|----|----|-----------------------|

Main nerves of leaves 5 to 6 pairs; leaves obtuse or very shortly acute or acuminate at apex:—

- | | |
|--|----------------------------|
| Leaves ovate or elliptic, membrano-chartaceous .. | 6. <i>P. divaricata</i> . |
| Leaves obovate or orbicular, chartaceous .. | 7. <i>P. trichostoma</i> . |
| Leaves elliptic or elliptic lanceolate, coriaceous-chartaceous | 8. <i>P. perakensis</i> . |

Main nerves of leaves 4 to 5 pairs, leaves broadly elliptic

9. *P. punctulata*.

Corymbs compact:—

Corymbs 3 in. in diam.; leaves membranous, ovate-acuminate, cordate or truncate at base, yellowish-brown when dry

10. *P. cordifolia*.

Corymbs 4 to 5 in. in diam.; leaves coriaceous, elliptic or elliptic-lanceolate, shortly acuminate at apex, attenuate at base; reddish-brown when dry

11. *P. Wrayi*.

Corymbs 8 in. in diam.; leaves membranous, broadly ovate, acuminate at apex, truncate or cordate at base; reddish-brown when dry.

12. *P. sterculifolia*.

Lower lip of calyx 2-lobed, calyx-tube subquadrangular; leaves under 3 in. long; corymbs rather small; corolla-tube slender

13. *P. Ridleyi*.

Calyx not 2-lipped:—

Calyx truncate or very obscurely lobed; leaves coriaceous, elliptic, obtuse at apex, rounded at base

14. *P. Kunstleri*.

Calyx subequally 5-lobed; leaves large, stellate tomentose, as are branchlets and inflorescence

15. *P. pyramidata*.

1. *PREMNA LITTORALIS*, King & Gamble in Kew Bull. 107 (1908). A small tree; branchlets nearly as thick as a goosequill, obscurely angled, tawny-pubescent, with small lenticels; the nodes marked by a ridge connecting the petioles. *Leaves* chartaceo-coriaceous; ovate or ovate-deltoid, acuminate at apex, cordate at base, the sinus .25 to .5 in. deep; both surfaces glabrous except the nerves, which are puberulous; margins acutely crenate-dentate except in the curves of the sinus; 4 to 6 in. long, 2 to 3 in. broad; midrib strong, raised beneath; main nerves 7 to 9 pairs, the lowest 1 to 2 pairs starting from the base and divaricate, the rest starting at an angle of about 50° with the midrib and curving upwards; transverse nervules distant, few, not prominent; petiole 1 to 1.5 in. long, slender, puberulous. *Cymes* in terminal, spreading, 3-chotomous, tawny-pubescent corymbs, reaching 4 in. in length and 6 in. in breadth; peduncles .75 to 1 in. long; primary branches up to 1.5 in. long, rest gradually shorter; bracts linear, persistent, the lowest sometimes leaf-like; pedicels very short, with a pair of minute bracteoles below the calyx; flowers very pale green. *Calyx* .075 to 1 in. long, 2-lipped, upper shortly 3-lobed, lower longer, 2-lobed; lobes rounded; tube pubescent without. *Corolla* 2-lipped, half as long

again as the calyx; upper lip broad, bifid, lower 3-lobed, the midlobe longest; all lobes rounded; tube glabrous without, also within except the belt of thick villous hairs just below the mouth. *Stamens* (in bud) included; filaments short, thick; anthers reniform, very shortly 1- to 2-mucronate. *Ovary* subglobose, depressed, glabrous except for a few glandular scales; style thick; stigma very shortly 2-fid. *Drupe* globose, glabrous, fleshy; endocarp tuberculate; cells 4, one only usually fertile. *Seed* oblong, acute at each end; testa membranous with a corky outer layer; cotyledons shortly oblong, obtuse, cordate, .05 in. long, fleshy.

PERAK: sea-coast at Matang, *Wray* 2719.

2. *PREMNA FLAVESCENS*, Ham.; Wall. Cat. 2649 (1828); Clarke in Hook. f. Fl. Br. Ind. IV. 578; Prain Beng. Plants, 831.

VAR. *rubens*, Clarke in Hook. f. Fl. Br. Ind. IV. 578 (1885). A shrub or small tree (a climber—*Koorders & Valetton*); branchlets the size of a crow-quill, grey-pubescent, obscurely angled. *Leaves* chartaceous when dry; ovate or ovate-oblong, acuminate at apex, cordate or rounded or somewhat cuneate at base; upper surface shining, sparsely setulose especially on the nerves, lower surface tawny-pubescent; entire or the upper half obscurely and distantly toothed; 4 to 6 in. long, 2 to 2.5 in. broad; midrib rather stout, raised beneath; main nerves 6 to 9 pairs, the lowest 1 or 2 (first very small) pairs from the base, at an angle of about 40° with the midrib, curving upwards to and along the margin, the upper ones joining in an intramarginal looped nerve which ends in the midrib at the acumination; transverse nervules many, conspicuous on the lower surface; petiole 1 to 1.5 in. long, slender, puberulous. *Cymes* in terminal tawny-pubescent corymbs about 4 in. in diam.; branches 3- then 2-chotomous; peduncle 1 to 2 in. long; bracts small, linear; pedicels short, under .05 in. long; flowers greenish. *Calyx* campanulate, .05 to .1 in. long, pubescent without, 2-lipped, upper lip 3-lobed, lower 2-lobed, all lobes obtuse, nearly equal; fruiting calyx saucer-shaped. *Corolla* funnel-shaped, .1 to .15 in. long, 2-lipped, upper lip shortly bilobed, reflexed, lower 3-lobed, the midlobe longest and oblong; tube much villous-hairy within. *Stamens* exsert; filaments flattened; anthers reniform, the cells nearly parallel. *Ovary* glabrous, depressed; style slender, as long as the stamens; stigma 2-lobed, the lobes slender, horizontally spreading. *Drupe* globose, .15 to .2 in. in diam., with numerous shining glands; endocarp tuberculate. *Seed* oblanceolate, about .1 in. long, usually one only in each drupe; cotyledons fleshy, ovate-oblong; radicle thick. *P. lucidula*, Miq. Fl. Ind. Bat. II. 898; Koord. & Val. Bijdr. VII. 188.

MALACCA: Ayer Punnas, *Griffith* (K.D.) 6020. — DISTRIB. Burma,

Java (*Teysmann* No. 10; *Zollinger* 645; *Koorders* 31425 β), Sumatra (*Forbes* 2621—a climbing shrub).

3. *PREMNA DERRYANA*, King & Gamble in *Kew Bull.* 107 (1908). A climbing (?) shrub; branchlets smooth, brown, with large circular or elliptic lenticels. *Leaves* membranous when dry, sessile; elliptic or obovate, shortly and obtusely acute at apex, attenuate and obscurely auricled at base; both surfaces shining, glabrous; margins entire; 5 to 8 in. long, 3.5 to 4 in. broad; midrib slender, impressed above, raised beneath; main nerves 7 to 8 pairs, often branched, curving upwards to and along the margin where they anastomose; transverse nervules slender, and with the minor reticulations rather prominent. *Cymes* in terminal panicles of three to four spikes, each spike with many interrupted glomerules of sessile flowers, the inflorescence 6 to 8 in. long; main peduncles 2 to 2.5 in. long, secondary peduncles .75 to 1 in. long; bracts lanceolate, at the main divisions, .25 in. long. *Calyx* deeply bilabiate; the upper lip entire at first, afterwards 2-lobed, .125 in. long, the lower one entire, .1 in. long; tube golden-pubescent without. *Corolla*-tube rather longer than the calyx, glabrous except for a few villous white hairs in the throat within; lips 2, posterior lip emarginate, erect, anterior lip 3-lobed, the lobes obtuse, the midlobe the longest. *Stamens* 4 long exsert; filaments puberulous, twisted; anthers reniform; cells opening by oblong pores. *Ovary* glabrous, depressed; cells 4, one only apparently seed-bearing; style slender, as long as the stamens; stigma of 2 slender horizontal lobes. *Drupe* not seen.

PERAK: on Larut Hills, *Derry* (*Curtis* 3701).

4. *PREMNA INTEGRIFOLIA*, Linn. *Mant.* II. 252 (1771); *Cooke Fl. Bomb.* II. 426; *Prain Beng. Plants*, 830. *P. serratifolia*, Linn. *l. c.* 253; *Schauer in DC. Prodr.* XI. 632; *Bedd. For. Man. in Flor. Sylv. CLXXII.*; *Trimen Fl. Ceyl.* III. 352. *P. spinosa*, *Roxb. Fl. Ind.* III. 77. *P. sambucina*, *Wall. Cat.* 1775; *Schauer, l. c.* 631. "*Gumira littorea*," *Rumph. Herb. Amb.* III. 209, t. 134.

VAR. *angustior*, *Clarke in Hook. f. Fl. Br. Ind.* IV. 574 (1885). A small shrub, 3 to 6 ft. in height; branchlets nearly glabrous, the size of a crow-quill, terete. *Leaves* elliptic or elliptic-ovate, obtusely acute at apex, rounded or narrowed at base; glabrous on both sides except on the midrib and main nerves; margins entire or obscurely crenate-dentate in the upper half; 2 to 3.5 in. long, 1 to 2 in. broad; midrib slender, puberulous above and raised, tawny-villous along the sides and in the axils below; main nerves 4 to 5 pairs, lowest 2 pairs rather close to the base and long, the rest more spreading and curved upwards to join in an obscure intramarginal looped nerve; few transverse nervules and reticulations obscure; petiole slender, puberulous, .25 to .5 in. long.

Corymbs puberulous, terminal or pseudo-axillary in upper axils, up to 2 in. broad; sessile or on peduncles up to 1.5 in. long; branches at first 3- afterwards 2-chotomous; bracts minute, lanceolate; pedicels very short; flowers greyish-white. *Calyx* 2-lipped; upper lip with 2 triangular lobes, lower obtuse, obscurely 2- to 3-dentate; tube rugose and puberulous without, .05 in. long. *Corolla*-tube cylindric, .1 in. long, puberulous; limb 2-lipped; upper lip subequally 3-lobed, the middle lobe slightly the longest and incurved; lower lip rounded obtuse, rather shorter, scarcely .05 in. long; upper half of tube within thickly white-villous. *Stamens* slightly exsert; anther-cells slightly divaricate. *Drupe* obovoid, depressed at top, rugose and obscurely ribbed, .15 in. long; endocarp ribbed, bony, 4-celled. *Seeds* ovoid, acute; testa pale, slightly corky; cotyledons flat, shallowly emarginate at top.

KEDAH: Langkawi Island, *Curtis* 2955. PENANG: *Kunstler* (*King's Collector*) 1670; *J. Scott*. PROVINCE WELLESLEY: at Batu Kawan, *Ridley* 9353. MALACCA: *Griffith* (K.D.) 6030; *Maingay* (K.D.) 1201. SINGAPORE: *Ridley* 8900.—DISTRIB. Amherst in Tenasserim, *Falconer*; tidal forests of Tavoy, *W. A. Hearsey*.

5. *PREMNA FÆTIDA*, Reinw. ex Blume Bijdr. 816 (1825). A large shrub or small tree with spreading branches, reaching 20 to 30 ft. in height; bark white; branchlets subtetragonous to cylindric, tawny-pubescent, as are the young leaves, the nerves of the mature leaves, and the inflorescence; nodes with a prominent villous ridge joining the bases of the petioles. *Leaves* chartaceous; ovate, sometimes ovate-lanceolate, rarely ovate-oblong, shortly acuminate at apex, rounded or truncate or slightly cordate at base; shining on the upper surface and dark when dry; paler, often almost grey on the lower surface; margins entire or slightly repand above; 3 to 6 in. long, 2 to 3.5 in. broad; midrib slender, prominent beneath; main nerves 6 to 8 pairs, the lowest 2 pairs almost from the base, the lowest spreading, the rest at about 45° with the midrib, gently curving to and along the margin; transverse nervules rather distant, irregular; petiole .75 to 2 in. long. *Corymbs* lax, reaching 5 in. long and broad, subsessile or on about 1 in. long peduncles, 3-chotomous below, 2-chotomous above; the branches divaricate; bracts very small, linear; pedicels short, under .05 in. long; flowers white. *Calyx* cup-shaped, .05 to .075 in. long, 2-lipped, upper lip acutely 2-lobed, lower very shortly 3-lobed; tube puberulous without. *Corolla*-tube funnel-shaped, .1 in. long, densely white-villous in the upper half within; obscurely 2-lipped, upper lip short, lower 3-lobed, recurved, the midlobe longest and incurved. *Stamens* attached to the throat of the corolla-tube, shortly exsert; anther-cells elliptic with elliptic pores.

Ovary depressed, glabrous; style short; stigma very shortly bifid. *Drupe* globose, 4-sulcate; epicarp rugose; cells 4, all or fewer with seeds. *Seeds* fusiform, keeled; testa pale. Schauer in DC. Prodr. XI. 630; Miq. Fl. Ind. Bat. II. 891; Koord. & Val. Bijdr. VII. 192. *P. opulifolia*, Miq. l. c. 898. *Gumira fetida*, Hassk. in Florã, 25 beibl. p. 26. "*Gumira domestica*," Rumph. Herb. Amb. III. 208, *vide* Miq. & Schauer.

KEDAH: near sea-level, *Kunstler* (*King's Collector*) 1737. PERAK: on the coast at Matong, *Wray* 2493; near sea-level, *Kunstler* (*King's Collector*) 1016. JOHORE: at Batu Pahat, *Ridley* 11137. SINGAPORE: cult., *Ridley* 6893.—DISTRIB. JAVA (*Koorders* 20179 β ; *Zollinger* 2740); Borneo (*Haviland & Hose* 3394, &c.).

We follow *Koorders & Valetton* in putting *P. opulifolia*, Miq., under *P. fetida*, Reinw. But our specimens agree better with the description of *P. opulifolia* than with those of *P. fetida*. As pointed out by *Koorders & Valetton*, the description of the calyx given for *P. fetida* as "obsolete sub-4-dentatus, vulgo 3-denticulatus, quarto dente abortivo" is abnormal. That given for *P. opulifolia* is quite correct.

6. PREMNA DIVARICATA, Wall. Cat. 1781 (1828). A climbing shrub; branchlets slender, terete, nearly black when dry, with sparse rounded or oblong lenticels. *Leaves* membranous when young, chartaceous when older; ovate or elliptic, briefly acute or bluntly acuminate at apex, rounded or attenuate sometimes subcordate at base; upper surface slightly shining, glabrous except the nerves; lower dull, glabrous except for villous hairs along the midrib and in the axils of the main nerves, obscurely dotted; entire; 3 to 5 in. long, 2 to 3.5 in. broad; midrib slender, slightly impressed above; main nerves 5 to 6 pairs, at an angle of 40° to 60° with the midrib, the lowest 1 to 2 pairs from near the base, curved upwards to join in loops near the margin; transverse nervules few, irregular, inconspicuous, as are the finely netted reticulations; petiole .5 to 1.5 in. long, channelled above. *Corymbs* divaricate, many-flowered, slightly puberulous, terminal, reaching in fruit 5 in. in diam., sessile or on peduncles 1 to 2 in. long, 3-chotomous below, 2-chotomous above; bracts linear-lanceolate, small, the lowest sometimes leafy; pedicels very short; flowers greenish-white. *Calyx* cup-shaped, prominently 2-lipped, the upper lip much longer than the lower, with 2 rounded .03 in. long lobes; the lower entire or shortly 3-toothed; tube rugose without and glandular-dotted. *Corolla*-tube cylindrical, .075 in. long, puberulous without, white-villous within on the upper half; limb 2-lipped; upper lip short, retuse, broad; lower lip 3-lobed, the midlobe longest, up to .075 in. *Stamens* inserted near the mouth of the corolla-tube, slightly exsert; anther-cells divaricate.

Ovary rounded; style as long as stamens; stigma very shortly bifid. *Drupe* ovoid, .25 in. long; epicarp smooth; pericarp fleshy; endocarp ribbed; pyrenes 3- to 4-celled. Schauer in DC. Prodr. XI. 681; Clarke in Hook. f. Fl. Br. Ind. IV. 575. *P. lucidula*, Kurz For. Fl. II. 263, not of Miq.

PENANG: beach at Tanjong Bunga, Curtis 215. DINDINGS: Pangkore Island, Ridley 7180. MALACCA: Maingay (K.D.) 1198-9; at Sungei Hudang, Goodenough 1350. SINGAPORE: gardens in scrub, Ridley 10841.—DISTRIB. Java.

7. *PREMNA TRICHOSTOMA*, Miq. Fl. Ind. Bat. II. 892 (1856). A large climbing shrub, reaching to a considerable height, the stem reaching 3 to 5 in. in diam.; branchlets thick, shining, glabrous, pale brown. *Leaves* at first chartaceous, afterwards subcoriaceous, very variable; ovate- or obovate-elliptic, sometimes nearly orbicular, shortly acuminate at apex or sometimes attenuately acute, rounded or subcordate or cuneate at base; glabrous on both surfaces except on the nerves; margins entire or sometimes undulate at apex; 4 to 7 in. long, 2 to 5 in. broad; midrib slender, raised beneath; main nerves 5 to 6 pairs, at from 30° to 45° with the midrib, the lowest pair from the base, the next rather close, the rest distant, all straight at first, then branched outwards and curved to join near the margin, raised on both surfaces when old; transverse nervules many; petiole .75 to 1 in. long, puberulous. *Corymbs* terminal, reaching 4 to 5 in. in diam., puberulous, sessile or on 1 in. long peduncles; branches 3- afterwards 2-chotomous, thickening in fruit; bracts lanceolate, short; pedicels none; flowers cream-coloured. *Calyx* cup-shaped, obscurely tetragonous, puberulous without, .05 to .07 in. long, 2-lipped, the upper lip 2-lobed, the lower faintly 2-toothed or entire; all teeth less prominent in fruit. *Corolla* campanulate; tube .1 in. long, densely villous within in the upper half; limb subequally 4-lobed, the lobes rounded, lower one slightly smaller, all recurved. *Stamens* inserted at the mouth of the corolla-tube, long exsert; filaments slightly flattened; anther-cells small, rounded, didymous, opening by elongated pores. *Stigma* 2-fid, the divisions divaricate, rather long. *Drupe* pyriform, 4-celled, one cell only enlarged and seed-bearing. *Seeds* oblong, flattened; testa membranous. Koord. & Val. Bijdr. VII. 184. *P. parasitica*, Clarke in Hook. f. Fl. Br. Ind. IV. 574, not of Blume.

KEDAH: Langkawi Island, Curtis 2796. PERAK: at waterfall, 300 ft., Wray 2403; King's Collector 3008, 10310; Scortechini 192. MALACCA: Griffith 6019. JOHORE: Ridley 11136. SINGAPORE: Ridley 5026, 6828, 8914.—DISTRIB. Borneo (*Haviland*).

8. *PREMNA PERAKENSIS*, King & Gamble in Kew Bull. 107 (1908).

A shrubby climber; branches brown, sparsely lenticellate, glabrous, smooth. *Leaves* chartaceo-coriaceous; elliptic-oblong or lanceolate, sometimes obovate, shortly and bluntly acute at apex, narrowed or cuneate at base; both surfaces glabrous, even the nerves, slightly rugose; margins entire, slightly recurved; 3 to 5 in. long, 1.5 to 2.25 in. broad; midrib stout, impressed above, raised beneath; main nerves 5 to 6 pairs, also impressed above and raised beneath, the lowest pair opposite and from close to the base, starting at from 25° to 40° with the midrib and nearly straight, curving only near the margin where they form a looped intramarginal nerve; transverse nervules many, inconspicuous; petiole .5 to .75 in. long, glabrous, channelled above. *Corymbs* spreading, tawny-puberulous, reaching 6 in. in length and in diam., 3-chotomous, afterwards 2-chotomous, sessile or on stout peduncles 2 to 3 in. long; bracts ovate-lanceolate, those of lower divisions leafy; pedicels 0; flowers pale green with white stamens. *Calyx* obscurely quadrangular, pubescent, nerved, the nerves prominent in fruiting examples, .06 in. long; 2-lipped, the upper lip 2-lobed, the lower entire or obscurely 2-lobed. *Corolla* funnel-shaped; the tube .125 in. long, densely white-villous in the upper half; limb subequally 4-lobed, the lobes recurved, ciliate. *Stamens* inserted at the mouth of the corolla-tube, long exsert; filaments somewhat flattened; anther-cells nearly globose, didymous, opening by circular pores; connective glandular. *Ovary* glabrous; style long exsert; stigma divaricately 2-fid. *Drupe* smooth, pyriform, one cell only fertile. *Seed* ovate-oblong, flattened; testa membranous.

PERAK: in rocky places in forest, at 800 to 1000 ft., *King's Collector* 7247, 10738; *Scortechini* 516.

This species comes very near to *P. trichostoma*, but has several important points of difference, such as the narrower, thicker leaves with glabrous nerves, the darker branches, the markedly nervose fruiting calyx, the large bracts, and the round openings of the anther-cells, so that we have preferred to describe it as a species instead of as a variety. In the corolla it nearly agrees, as also it does in the absence of pedicels and the one-seeded, pyriform drupe.

9. *PREMNA PUNCTULATA*, Clarke in Hook. f. Fl. Br. Ind. IV. 575 (1885). A shrub or small tree; branchlets dark brown, terete, lenticellate. *Leaves* chartaceous; broadly elliptic, suddenly shortly acuminate at apex, rounded at base; upper surface glabrous, shining, lower surface paler, reddish, puncticulate, pubescent on the nerves; margins entire; 4 to 6 in. long, 2 to 3 in. broad; midrib prominent; main nerves 4 to 5 pairs, the lowest pair very small, close to the base, the next pair a little above, the rest more distant, all curving upwards to

anastomose near the margin; transverse nervules very prominent, as is the netted reticulation; petiole 1 in. long, slender, channelled above. *Corymbs* many-flowered, terminal, paniculate, pubescent, 4 to 5 in. in diam.; lower bracts .5 in. long, linear-oblong; pedicels very short or none. *Calyx* .06 in. long, minutely grey-pubescent and glandular, 2-lipped, upper lip 2-toothed, lower lip also 2-toothed or subentire. *Corolla* tubular, .1 in. long, villous at the throat within, glabrous below; lobes short, rounded. *Stamens* included; filaments inserted in the middle of the tube, short; anthers reniform; cells slightly divergent. *Ovary* glabrous; style rather short; stigmatic lobes slender, recurved. *Drupe* not known.

MALACCA: *Maingay* (K.D.) 1200.

10. *PREMNA CORDIFOLIA*, Roxb. Fl. Ind. III. 78 (1832). A shrub, reaching 8 to 12 ft. in height, with dark brown bark on the old wood; branchlets light brown, darker when dry, the size of a crow-quill, glabrous, terete. *Leaves* membranous; ovate or ovate-cordate, acuminate at apex, rounded or cordate at base; upper surface shining, bullate, drying brown, glabrous except on the midrib and main nerves; lower surface also nearly glabrous, yellowish-brown when dry; margins entire, slightly recurved; 3 to 7 in. long, 2 to 3 in. broad; midrib slender, but strongly raised beneath; main nerves 5 to 6 pairs, at about 50° with the midrib, at first nearly straight and then curving to join in a looped intramarginal nerve, each pair on the same side joined by few (4 to 5) irregular transverse nervules and lesser reticulations; petiole slender, .5 to 1 in. long; upper side tawny-puberulous. *Corymbs* many-flowered, dense, terminal, tawny-puberulous, about 3 in. long, and the same or rather more in diam.; peduncles 1 to 3 in. long, with tawny-puberulous leaf-like bracts; bracts of corymb small, lanceolate, acute; branches at first decussate, then dichotomous; pedicels very short, rather thick; flowers greyish-white. *Calyx* .1 in. long, 2-lipped; upper lip 2-lobed, lower entire; lips short, broad, rounded. *Corolla*-tube .2 in. long, funnel-shaped, densely villous within; limb 2-lipped; anther-cells shortly divergent. *Ovary* glabrous; style as long as corolla-tube. *Drupe* obovoid, slightly depressed at top; exocarp thin, shining, black; mesocarp fleshy; endocarp hard, pitted, 3- to 4-celled, one cell usually only fertile. *Seed* ovoid acute; cotyledons flat, orbicular, .125 in. in diam. Walp. Rep. IV. 94; Schauer in DC. Prodr. XI. 632, *partly, not of Wight or Bedd.*; Miq. Fl. Ind. Bat. II. 895, *in part only*; Clarke in Hook. f. Fl. Br. Ind. IV. 572.

PENANG: at Tanjong Bunga, *Curtis* 861; *Kunstler* (*King's Collector*) 1480. PROVINCE WELLESLEY: at Krian, *Ridley* 9386. SINGAPORE: *Lobb*.

11. *PREMNA WRAYI*, King & Gamble in Kew Bull. 108 (1908). A climbing nearly quite glabrous shrub; branches stout, obscurely quadrangular, dark brown; branchlets similar, darker, smooth. *Leaves* coriaceous; elliptic or elliptic-lanceolate, gradually acuminate at apex, attenuate at base, often unequally; shining and glabrous on both surfaces except for small tufts of hair in the axils of the main nerves beneath, olive-brown when dry; entire; 4 to 8 in. long, 2 to 4 in. broad; midrib stout, impressed above, prominently raised beneath; main nerves 6 to 8 pairs, impressed above, raised beneath, the lowest pair very faint from the base and close to the margin, the next stout and shortly above, the rest distant at about 50° with the midrib, curving upwards to and along the margin, the upper ones joined in a looped intramarginal nerve; transverse nervules straight and fairly regular; reticulations rather prominent on the upper surface when dry; petiole .5 to 2 in. long, channelled above. *Corymbs* dense and compact, about 4 to 5 in. broad at top, glabrate or very minutely puberulous on upper branches and calyx; lower branches 3-chotomous, upper 2-chotomous, much ramified and curving inwards; peduncle about 1 in. long, stout; main branches 1 to 1.5 in. long; bracts very small, linear, the lower ones leafy; pedicels about .05 in. long to the joint below the calyx-tube. *Calyx* deeply 2-lipped; the upper lip sharply 2-lobed, the lower 3-toothed; the lobes spreading in the fruiting stage; tube rugose. *Corolla* not seen. *Drupe* obovoid, .25 in. long and broad; epicarp rugose, glandular-dotted; pyrenes 4. *Seeds* plano-convex, ovate, .175 in. long; testa white-corky; cotyledons oblong, retuse at tip, flat, fleshy, .15 in. long; radicle .025 in.

PERAK: at Tapa, Wray 200.

At first sight this species resembles *P. Kunstleri* in its coriaceous shining leaves and stout branches, but differs in the more compact corymbs and the deeply lobed calyx.

12. *PREMNA STERCULIFOLIA*, King & Gamble in Kew Bull. 108 (1908). A stout, tree-like, climbing shrub; branches reddish-brown, smooth; branchlets terete, purple, sparsely scabridly puberulous. *Leaves* membranous; ovate, acuminate at apex, truncate or somewhat cordate at base; both surfaces reddish-brown when dry; upper sparsely setulose and pubescent on the nerves, lower slightly puberulous, sparsely glandular-dotted; 4 to 9 in. long, 3 to 5 in. broad; midrib prominent, channelled above, raised beneath; main nerves 6 pairs, raised beneath, the 2 lowest pairs from close to the base spreading, the rest at about 40° with the midrib, curved upwards to and along the margin, joined by prominent transverse nervules; petiole 2 to 4 in. long, channelled above. *Cymes* in large spreading, slightly puberulous

many-flowered paniculate corymbs reaching 9 in. long and 8 in. broad; peduncles stout, 3 to 4 in. long; branches 3-chotomous at first, afterwards 2-chotomous; ultimate cymules crowded; bracts linear, very small, caducous; pedicels short, slender; flowers pale green. *Calyx* campanulate, obscurely 2-lipped; the upper lip nearly entire, the lower entire or obscurely toothed; tube .05 in. long, glandular and puberulous, scaly without. *Corolla*-tube funnel-shaped, puberulous, .125 in. long, densely white-villous within except at the base; 2-lipped, upper of 1 short recurved lobe, lower of 3 recurved obtuse lobes, the midlobe the longest, .075 in. long. *Stamens* exsert; the filaments twisted; anthers ellipsoid, divaricate. *Ovary* glabrous, depressed; style slender, nearly .25 in. long; stigma bifid with slender spreading lobes. *Drupe* globose, depressed, much tuberculate and red when dry; pyrene woody, tuberculate, roughly 4-angled. *Seeds* usually 1 only perfect, obovate, .1 in. long; testa membranous; cotyledons conform to the seed, fleshy; radicle pointed.

PERAK: at waterfall, Wray 1828; *Scortechini*; King's Collector 3067, 7531, 8373.

VAR. *cordata*, King & Gamble, *l. c.* *Leaves* more deeply cordate at base; branches of inflorescence more distant than in type; calyx with upper lip 2-lobed, the lower entire or obscurely toothed.

PERAK: *Scortechini* 273.

13. *PREMNA RIDLEYI*, King & Gamble in Kew Bull. 109 (1908). A climbing shrub; branches stout, with grey shining bark; branchlets slender, terete, brown. *Leaves* chartaceous, opposite or sometimes one of each pair rather higher than the other; ovate, ovate-oblong or slightly obovate, rounded or very shortly acute at apex, rounded or attenuate often unequally at base; both surfaces glabrous and dull; margins entire; 1.5 to 3 in. long, .75 to 1.5 in. broad; midrib slender; main nerves 6 to 7 pairs, the lowest 1 or 2 pairs from the base, at an angle of 30° to 40° with the midrib, straight at first, then gently curved to and along the margin; transverse nervules and reticulations faint; petiole slender, .25 to .5 in. long. *Corymbs* terminal, 1.5 to 5 in. long, and 2 to 5 in. broad, many-flowered, tawny-puberulous; peduncles .75 to 2 in. long; branches at first 3- afterwards 2-chotomous; bracts linear-lanceolate, small; pedicels none or minute; flowers greenish-white. *Calyx* campanulate, subquadrangular, 2-lipped, each lip 2-lobed, with minute teeth; tube .05 in. long, puberulous. *Corolla*-tube somewhat tubular, slender, .1 in. long, puberulous in the lower half within, long white-villous in the upper; lobes 4, equal, oblong, rounded at tip, .05 to .075 in. long, incurved at length. *Stamens* inserted, 2 upper at the top of the throat of the corolla-tube, 2 lower lower down; filaments slightly flattened, long exsert; anthers small; cells rounded, slightly

divaricate; connective glandular on the back. *Ovary* rounded, glabrous; style as long as stamens, .2 in.; stigma bifid; the lobes .025 in. long, usually recurved. *Drupe* not seen.

PERAK: *Scortechini* 455. SINGAPORE: garden jungle, *Ridley* 6826.

14. *PREMNA KUNSTLERI*, King & Gamble in *Kew Bull.* 109 (1908). A large shrub or small tree, nearly quite glabrous, sometimes climbing; branches stout, thick, purplish-brown; branchlets the size of a quill, terete, glabrous, sparsely lenticellate. *Leaves* coriaceous, elliptic, sometimes elliptic-oblong or obovate, obtuse at tip with a short blunt abrupt acumination, rounded or subcordate at base; both surfaces glabrous, more or less shining when dry; margins entire, slightly recurved; 4 to 7 in. long, 2.5 to 4 in. broad; midrib very stout, impressed above, raised prominently beneath; main nerves 5 to 7 pairs at from 50° to 60° with the midrib, the lowest pair small, from the base, the second from close above it, the rest more distant, all curved upwards to join in a looped intramarginal nerve and joined by four irregular transverse veinlets; reticulations minutely netted, forming a prominent network on the upper surface when dry; petiole .75 to 1.25 in. long, smooth but channelled above. *Corymbs* terminal, spreading, long-branched, 3-chotomous below, 2-chotomous above, glabrous except for very minute spare tawny pubescence on the upper branches and calyx-tube, sessile or pedunculate, the peduncle or primary branches 3 to 4 in. long, the whole corymb reaching 7 in. in length and 5 in. in breadth; bracts linear or linear-lanceolate, the lower ones leafy; pedicels very short, less than .05 in. to the joint under the calyx-tube; flowers pale greenish-white. *Calyx* cup-shaped, .075 in. long, truncate or very obscurely 2-lipped, in fruit very shallow and almost quite entire. *Corolla*-tube tubular, .125 in. long, the lower half glabrous and almost hyaline, the upper shortly white-villous; limb 2-lipped, lower lip 3-lobed, the midlobe longest, the two others and the upper lip equal, all erect or incurved. *Stamens* shortly exsert, attached just below the mouth of the corolla-tube; anther-cells rounded, slightly divaricate, pores elliptic. *Ovary* glabrous, depressed, 4-celled; style as long as stamens; stigma very shortly bifid. *Drupe* obovoid, faintly ribbed, .25 in. long; epicarp smooth, waxy-white (*Kunstler*); pyrenes 4-celled, one or more cells fertile. *Seeds* obovate, plano-convex, .15 to .2 in. long; testa white, corky; cotyledons flat, fleshy, .15 in. long, .1 in. broad, retuse at tip; radicle minute.

PERAK: on low ground, under 500 ft. in alt. *King's Collector* 938, 4723, 5949. MALACCA: at Sungli Udang, *Goodenough* 1350.

To this species we also refer *Forbes'* No. 1424 from the Lampongs, Sumatra, but the leaves reach over 8 in. in length and 5 in. in breadth with slightly attenuate bases, and the fruiting calyx is rather more 2-lipped.

15. *PREMNA PYRAMIDATA*, Wall. Cat. 1779 (1827). A small or medium-sized tree (a large tree—*Wallich*), reaching 40 to 50 ft. in height, and up to 5 ft. in girth; bark light greyish-brown; branches stout, pale brown; branchlets obscurely quadrangular, stellately tomentose with tawny tomentum. *Leaves* chartaceous; ovate, acuminate at apex, cordate or rounded sometimes attenuate at base; both surfaces brown when dry, the upper dark glabrous except on the nerves, the lower pale glabrescent; margins entire; 6 to 14 in. long, 3 to 8 in. broad; midrib stout, stellate-tomentose on both surfaces; main nerves 7 to 10 pairs, the lowest two pairs from near the base, the rest distant at an angle of about 60° with the midrib, curving gently upwards and joined by many regular transverse nervules very prominent on the under surface; petiole 1 to 4 in. long, channelled above, stellately scurfy-pubescent. *Cymes* in large terminal stellately-pubescent pyramidal panicles or corymbs, reaching 12 in. in length, and 6 to 9 in. in breadth; common peduncle 1 to 3 in. long; branches at first 3- afterwards 2-chotomous, usually ascending; bracts many, linear, reaching .5 in. long; flowers crowded at the ends of the branches on very short pedicels, greenish-white. *Calyx* campanulate, glabrous within, stellately-pubescent without; tube .075 in. long; teeth 5, subequal, about .025 in. long, the posterior three thickened, the two anterior shorter and more slender. *Corolla* bilabiate, .15 to .2 in. long; upper lip broad; lower lip 3-lobed, the midlobe the longest and spreading, the side lobes shorter and more obtuse, usually incurved; tube with a ring of retrorse stiff hairs at the throat, otherwise glabrous. *Stamens* 4, included; anther-cells elliptic, slightly divaricate; filaments stout. *Ovary* glabrous, depressed; style thickened with very shortly bifid stigma. *Drupe* globose or obovoid, glabrous, depressed at top, .2 to .25 in. in diam.; pericarp fleshy; pyrene rugose, very hard, 4-celled. *Seed* usually 1 only, oblong. Schauer in DC. Prodr. XI. 633; Miq. Fl. Ind. Bat. II. 897; Hook. f. Fl. Br. Ind. IV. 576. *P. tomentosa*, Kurz For. Fl. II. 260.

PERAK: *Wray* 3691; *Scortechini*; at Kwala Dipang, *Ridley* 9699; *King's Collector* 923, 2039, 2667, 6851, 10298. SELANGOR: *Ridley* 7596.—DISTRIB. Burma (*Wallich* 1779), Java (*Teysmann* 14), Timor (*Forbes* 3892), &c.

We have identified *Teysmann's* Java specimens as belonging to *P. pyramidata*, but we are not sure if *Koorders & Valeton* (*Bijdr.* VII. 179) considered them to belong to their *P. tomentosa*, which, judging by *Koorders' own* specimens 9714 β in the Calcutta Herbarium, is not *P. pyramidata*. We have, therefore, not quoted *Koorders & Valeton*. We agree with *Sir D. Brandis* ('*Indian Trees*,' 511) in thinking that *P. bengalensis*, *Clarke*, is probably only a narrow-leaved form of *P. pyramidata*.

A specimen bearing Father Scortechini's ticket, but without number and without any note of locality, appears to be *Premna acuminata*, R. Br. Prod. Nov.-Holl. 512; Benth. & Muell. Fl. Aust. V. 60, a North Australian species with long-petioled, cordate-ovate, deltoid, poplar-like leaves, and very loose panicles. It may very likely have been collected in a Botanic Garden.

A specimen collected by R. Derry at Bukit Borwang, Malacca, is too incomplete for identification. It may belong to *P. leucostoma*, Miq. Fl. Ind. Bat. II. 899.

8. GMELINA, Linn.

Trees or shrubs, unarmed or armed with axillary divaricate spines (abortive branchlets). *Leaves* opposite, entire or more or less lobed. *Flowers* large, yellow or brownish-yellow, often tomentose, in dense or lax sessile or pedunculate cymes along the branches of a terminal panicle; bracts usually small, sometimes large, leafy and coloured. *Calyx* campanulate, 4- to 5-toothed or subentire, persistent and unaltered in fruit. *Corolla* obliquely campanulate or funnel-shaped; tube slender below, much dilated above; limb spreading, oblique, 4- to 5-lobed. *Stamens* 4 didynamous, inserted below the throat of the corolla, included; anthers pendulous, with oblong sub-separate cells. *Ovary* 4-celled, the cells 1-ovuled; style slender; stigma shortly 2-fid; ovules laterally attached to the septum at their middle or higher. *Fruit* a succulent drupe; endocarp bony, 2- to 4-celled, usually with a conical hollow in the middle open on one side. *Seeds* oblong; testa thin, with a corky layer outside; albumen none; cotyledons fleshy; radicle inferior.—DISTRIB. Species about 11, in India, Malaya, China and Australia.

Leaves glaucescent beneath with minute glands, usually 3- or more		
lobed .. .. .	.. .. .	1. <i>G. asiatica</i> .
Leaves fulvous-tomentose beneath, rarely lobed	.. .. .	2. <i>G. villosa</i> .

G. HYSTRIX, Schultes ex Kurz in Journ. As. Soc. XXXIX. ii. 81 (1870), and For. Fl. II. 265, is a large spinous scandent shrub with very large coloured bracts, a native of Siam and the Philippines, also, according to Kurz, Tenasserim. It is probably only a garden escape in Singapore (Garden road, Ridley 3944).

1. GMELINA ASIATICA, Linn. Sp. Pl. 626 (1753). A much-branched spinous straggling shrub; bark yellowish-white; branchlets horizontal, rigid, puberulous, the smaller ones often becoming spines at their ends. *Leaves* membranous; ovate or elliptic or obovate, often 3- or more lobed, the midlobe the longest; upper surface glabrous, lower surface glaucescent from a coating of minute round glands, and villous on the nerves; margins entire except for the 3 or sometimes more lobes which point upwards; .75 to 1.5 in. long, .5 to 1 in. broad; midrib slender; main nerves 2 to 3 pairs; reticulations few; petiole very

slender, up to .5 in. long. *Racemes* fulvous-tomentose, terminal, 1 to 2 in. long; cymules very short; bracts small, caducous; pedicels very short flowers bright yellow. *Calyx* .15 to .2 in. long; tube with large flattened glands, otherwise pubescent; teeth 4, very small, triangular, acute. *Corolla* 2-lipped, obliquely funnel-shaped, puberulous without, nearly 2 in. in length; tube slender below, gradually inflated above; lobes 4, ovate, more or less rounded, the lowest the longest. *Stamens* curved, slightly exsert; filaments thickened, pubescent; anther-cells opening in a horseshoe, connective flattened, all 4 similar. *Ovary* depressed, glabrous; style slender, exsert; stigma 2-lobed. *Drupe* obovoid, yellow when ripe, .75 in. long; pyrene pyriform with a basal cavity, bony. *Seeds* usually 1 or 2 only, oblong at base; testa membranous with a corky covering; albumen fleshy. Roxb. Fl. Ind. III. 87; Lamk. Ill. t. 542; Wall. Cat. 1818 (*in part*); Schauer in DC. Prodr. XI. 679; Wight Ill. t. 174; Bedd. Fl. Sylv. CXXXII; Brandis For. Fl. 365; Blume Bijdr. 814; Miq. Fl. Ind. Bat. II. 866; Clarke in Hook. f. Fl. Br. Ind. IV. 582; Trimen Fl. Ceyl. III. 355; Cooke Bomb. Fl. II. 425; Prain Beng. Plants 829. *G. coromandeliana*, Burm. Fl. Ind. 132. *G. lobata*, Gaertn. Fruct. I. 268, t. 56, *excl. syn.* Rumph. *G. parvifolia*, Roxb. Cor. Pl. II. 32, t. 162; Wall. Cat. 2654; Schauer, *l. c.* *G. parviflora*, Roxb. Fl. Ind. III. 87. *G. inermis*, Blanco Fl. Filip. 493. *Michelia spinosa*, Amman. in Act. Petrop. VIII. 218, t. 18.

PERAK: *Scortechini*. SINGAPORE: *T. Anderson* 135; *Kurz*; *Kunstler* 102.—DISTRIB. India (Deccan Peninsula), Ceylon, Java, Borneo, &c.

2. *GMELINA VILLOSA*, Roxb. Hort. Beng. 46 (1814), and Fl. Ind. III. 86 (1832). A large straggling shrub or small tree with olive-coloured bark; branches spreading and drooping; branchlets round, villous; spines straight, axillary, .25 to .5 in. long. *Leaves* membranous when dry; ovate trapeziform, acute at apex, cuneate at base; upper surface pubescent when young, glabrous and dark-coloured when old; lower surface fulvous-tomentose; margins entire or sometimes obscurely lobed; 1 to 4 in. long, 1 to 2.5 in. broad; midrib slender, raised beneath; main nerves pubescent above, 3 to 4 pairs, the lowest pair from just above the base; transverse nervules slender, nearly horizontal; petiole slender, .75 to 1.5 in. long, channelled above. *Racemes* fulvous-tomentose, 1 to 2 in. long; cymules very short; bracts ovate-lanceolate, cuspidate, about .5 in. long, more or less leafy, deciduous when the flowers open; pedicels very short; flowers yellow. *Calyx* .15 in. long; tube with 3 or more large glands on the under side; teeth 4, small, triangular, acute. *Corolla*-tube slender below for nearly .5 in., then obliquely expanded for nearly 1 in., including the 4 lobes, the lowest of which is longest. *Anthers*, especially of longer pair of stamens, with the connec-

tive enlarged behind. *Style* slender, as long as the longer pair of stamens; stigma 2-lobed, lobes unequal. *Drupe* globose, yellow when ripe, fleshy, .75 in. in diam.; pyrene pyriform, .5 in. long, with a cavity opening on one side at the base; endocarp very hard, thick. *Seeds* usually 1 to 2 only fertile, compressed, acute at the ends; cotyledons fleshy, obcordate, .25 in. long; radicle very small. Jack in Mal. Misc. I. 17, and in Hook. Bot. Misc. I. 284; Wall. Cat. 1816; Schauer in DC. Prodr. XI. 679; Miq. Fl. Ind. Bat. II. 867; Clarke in Hook. f. Fl. Br. Ind. IV. 582; Koord. & Val. Bijdr. VII. 198. *G. asiatica*, Wall. Cat. 1818 (*in part*); Kurz For. Fl. II. 265 (*not of Linn.*). *Gmelina*, sp. n. 2, Griff. Notul. IV. 179. "*Radix deipara*," Rumph. Herb. Amb. II. 124, t. 39.

KEDAH: Langkawi Island, *Curtis*. PENANG: *Wallich* 1816; *Phillips*; *G. King*; *Curtis* 454. PERAK: *Wray* 734; *Scortechini* 740. MALACCA: *Griffith* 6057; *Maingay* (K.D.) 1189. SINGAPORE: *G. Thomson*; *Kurz*; *T. Anderson*; *Deschamps*; *Kunstler* 103.—DISTRIB. Burma (*Kurz*), Nicobars (*Kurz*), Siam, Java, Sumatra (*Forbes* 1576, 2642).

9. CLERODENDRON, Linn.

Trees or shrubs, sometimes straggling or climbing. *Leaves* opposite or rarely verticillate, simple; entire or dentate or angularly-lobed. *Flowers* small or large, of various colours, in axillary cymes or terminal panicles, often leafy below; bracts conspicuous or small; bracteoles 0 or very small. *Calyx* campanulate, rarely tubular, truncate, 5-toothed or almost 5-partite, persistent, often accrescent, often coloured in fruit. *Corolla* hypocrateriform or infundibular; tube usually long, slender; limb usually oblique, more or less 2-lipped, 5-lobed, the lobes spreading. *Stamens* 4 didynamous, long-exserted; filaments filiform, involute in the bud; anthers ovate or oblong, more or less uniform; cells parallel, adherent above, separate below; filaments attached at the notch. *Ovary* imperfectly 4-celled, the cells 1-ovuled; style filiform; stigma shortly bifid. *Fruit* a globose, succulent or rarely dry drupe, 4-grooved or 4-lobed, separating into 4 pyrenes, of which 1 to 3 are sometimes suppressed; exocarp usually fleshy; endocarp bony or crustaceous. *Seeds* oblong or pyriform; albumen 0; cotyledons thick, fleshy; radicle very small, inferior.—DISTRIB. 100 to 120 species, in the warm regions of both hemispheres, but chiefly in the eastern.

Corolla hypocrateriform, the tube rarely more than 1 in. in length (Subgenus 1. EUCLERODENDRON):—

Cymes axillary:—

Cymes few-flowered from most axils; leaves small; calyx-teeth very short

.. 1. *C. neriifolium*.

- Cymes in deflexed, pedunculate, close panicles, from upper axils; leaves large; calyx-lobes linear-lanceolate, over .2 in. long 2. *C. deflexum*.
- Cymes in leafy panicles, the lower branches appearing axillary:—
- Leaves and inflorescence glabrous or only slightly puberulous; leaves usually over 1 in. broad, long-acuminate, membranous 3. *C. disparifolium*.
- Leaves and inflorescence scabrous-hispid, more or less pubescent; leaves under 1 in. broad, acute, chartaceous 4. *C. lankawiense*.
- Cymes in terminal panicles:—
- Leaves oblong or lanceolate:—
- Panicles more or less pendulous, long-pedunculate:—
- Leaves 1 to 3 in. broad; calyx-lobes lanceolate, acute 5. *C. penduliflorum*.
- Leaves 2 to 6 in. broad; calyx-lobes ovate, cuspidate 6. *C. umbratile*.
- Panicles erect, short-pedunculate or sessile:—
- Leaves entire; calyx cleft nearly to the base; stems fistular:—
- Leaves glabrous; main nerves distant; calyx-lobes acuminate with incurved tips 7. *C. myrmecophilum*.
- Leaves puberulous; main nerves rather close; calyx-lobes acute, glandular 8. *C. Curtisii*.
- Leaves serrate, rarely entire; calyx truncate; teeth minute 9. *C. serratum*
var. *Wallichii*.
- Leaves ovate, usually cordate at base:—
- Panicles pyramidal, thyrsoïd; leaves hairy:—
- Corolla-tube over .5 in. long; leaf-margins dentate 10. *C. infortunatum*.
- Corolla-tube under .3 in. long; leaf-margins entire 11. *C. villosum*.
- Panicles corymbose; leaves glabrous; corolla-tube over .75 in. long 12. *C. Colebrookianum*.
- Leaves usually 3 to 7-lobed, under surface prominently glandular 13. *C. paniculatum*.
- Corolla infundibuliform, the tube more than 1 in. in length (Subgenus 2. SIPHONANTHUS):—
- Leaves usually verticillate, lanceolate; panicle very long, many-flowered; drupe blue 14. *C. Siphonanthus*.
- Leaves opposite, elliptic or ovate; panicle short, few-flowered; drupe red 15. *C. Ridleyi*.

The following species are found in cultivation or as escapes from cultivation:—

CLERODENDRON FRAGRANS, R. Br. in Ait. Hort. Kew. ed. 2, IV. 63 (1812). A double-flowered shrub, with large leaves of unpleasant odour, the flowers white merging into dark purple and fragrant.—SINGAPORE: *Deschamps*; *King's Collector* 304.

C. CALAMITOSUM, Linn. Mant. 90 (1767). A slender white-flowered shrub, native of Java and often found in gardens. In the Fl. Br. Ind. it has been described as a Malacca species on the authority of Main-gay's specimen, but Mr. Ridley informs us that in his opinion the plant is not indigenous and that Maingay's specimen came, in all probability, from a garden escape.

C. THOMSONÆ, Balf. f. in. Trans. Bot. Soc. Edinb. VII. 265, t. 7, and 580, t. 16 (1863). A climbing shrub, native of Tropical Africa, with opposite ovate leaves and terminal lax cymes of flowers with a white calyx and crimson corolla.—PENANG: Curtis 124. SINGAPORE: Deschamps.

C. SQUAMATUM, Vahl Symb. II. 74 (1791). An erect shrub, native of India, China, and Sumatra, with ovate cordate leaves and scarlet flowers in large panicles.—SINGAPORE: Ridley 9209.

1. CLERODENDRON NERIIFOLIUM, Wall. Cat. 1789 (1828). A straggling shrub; branches ashy-grey, lenticellate; branchlets slender, greyish-brown. *Leaves* membranous, ternate or opposite; elliptic, acute or rounded often slightly emarginate at apex, shortly attenuate at base; glabrous, or, when young, sparsely pubescent on both surfaces; margins entire; 1.5 to 3.5 in. long, .75 to 1.75 in. broad; midrib slender; main nerves about 5 pairs, straight or branched to meet in an obscure looped intramarginal nerve; reticulations finely netted; petiole slender, .25 to .5 in. long. *Cymes* axillary, umbellate, sometimes in a 7-flowered dichasium, often only 3-flowered; peduncle 1 to 1.5 in. long; bracts linear, setaceous; bracteoles similar but smaller; pedicels .15 to .25 in. long; flowers white, purplish-pink (*Forbes*). *Calyx* tubular-campanulate, enlarged in fruit and then cup-shaped; tube .15 in. long, pubescent and gland-dotted without; teeth 5, minute. *Corolla*-tube very slender, .75 to 1 in. long; gland-dotted without, villous within; lobes 5, spreading, unequal, somewhat oblong, about .25 in. long. *Stamens* red, long-exserted; anther-cells oblong, parallel. *Ovary* cylindric, obtuse; style very slender; stigma shortly bifid. *Drupe* obovoid, .5 in. long, 4 in. in diameter; top depressed; exocarp spongy; pyrenes 4 readily separating, endocarp crustaceous. *Seed* obovoid; testa thin; cotyledons oblong, thick, fleshy; radicle very short, thick. Schauer in DC. Prodr. XI. 660; Miq. Fl. Ind. Bat. II. 839; Clarke in Hook. f. Fl. Br. Ind. IV. 589; Prain Beng. Plants 835. *C. inerme*, Benth. Fl. Hongk. 271, and Fl. Austral. V. 61; Schauer *l. c.* (*in part*); Wall. Cat. 1788, Sheet 1 or A. *C. inerme* var. *neriifolia*, Kurz For. Fl. II. 266. *Volkameria neriifolia*, Roxb. Fl. Ind. III. 64. "*Jasminum litoreum*," Rumph. Herb. Amb. V. t. 46.

KEDAH: in Langkawi Island, Curtis (*Hamad*). PENANG: at Batu Ferengy, Curtis 2782; (or SINGAPORE), Wallich 1788, 1. PERAK: at

Krian, *Scortechini* 1382. MALACCA: *Griffith* (K.D.) 6056,1; on swampy ground near the sea, *Maingay* (K.D.) 1188. JOHORE: *G. King*. SINGAPORE: *Kunstler* 59; *Hullett* 143; seashore, *Deschamps*.—DISTRIB. India (Chittagong at Mascal Island), Burma (Arracan and Tenasserim coasts), Sumatra (*Forbes* 1802), Borneo (*Haviland* 1018, 3555), Siam, Philippine Islands, China, Australia, Polynesia.

A coast plant, similar to *C. inerme*, Gaertn., of the coasts of India, and considered by some to be a variety of it. It is distinguished by the leaves of different shape and texture, the smaller and more slender and glandular corolla, and the larger drupe. The leaves are sometimes lanceolate (see Roxb. Ic. No. 2524).

2. CLERODENDRON DEFLEXUM, Wall. Pl. As. Rar. III. 10, t. 215 (1832), and Cat. 1808. A shrub, reaching in height 4 ft. (*Wallich*), 4 to 6 ft. (*Kunstler*); branches obscurely quadrangular, furrowed, pubescent, pale-brown. *Leaves* opposite, membranous when dry; variable in shape, elliptic oblong-obovate or oblanceolate, cuspidate-acuminate at apex, rounded or cuneate at base; upper surface slightly pubescent when young, afterwards glabrous except on the nerves; lower surface softly pubescent, at length glabrate; margins entire or slightly undulate repand; 6 to 16 in. long, 2 to 6 in. broad; midrib strong, prominent beneath, pubescent; main nerves 10 to 16 pairs, prominent beneath, the lowest pair from the base at an acute angle, the rest curving upwards to and along the margin; transverse nervules rather regular and conspicuous in old leaves; reticulations netted; petiole 1 to 2·5 in. long, pubescent, swollen above and below, channelled on the upper side. *Panicles* corymbose, axillary in the ultimate or penultimate axils of the branches, usually deflexed at right angles to the branch; peduncles 1 to 8 in. long, with 1 or 2 pairs of bracts like small leaves along them; bracts of the inflorescence lanceolate; corymbs crowded with single flowers or short trichotomous cymes, very many-flowered; bracteoles many, linear; peduncles, bracts, branches and calyx all red when fresh; buds clavate; flowers white tinged with pink. *Calyx*-tube very short, scarcely ·1 in. long; lobes linear-lanceolate, erect, pubescent, ·2 to ·3 in. long; fruiting calyx enlarged and stellately spreading. *Corolla*-tube very slender, ·5 to ·75 in. long, glabrous; lobes subequal, spreading, spatulate, up to ·25 in. long. *Stamens* long-exsert, filaments very slender, glabrous, anthers oblong; cells parallel. *Ovary* rounded, obtuse; style very slender; stigmatic branches short. *Drupe* purple, globose, depressed, smooth, with 4 or fewer pyrenes; pyrenes pyriform, ·35 in. long, ·25 in. broad; endocarp crustaceous, reticulate; seeds conform to the pyrenes; testa membranous;

cotyledons unequal, fleshy; radicle very small. Schauer in DC. Prodr. XI. 665; Miq. Fl. Ind. Bat. II. 875; Clarke in Hook. f. Fl. Br. Ind. IV. 593.

PENANG: *Porter* (*Wallich* 1808A); *Curtis* 81. PERAK: at Gunong Ijuk, &c., *Scortechini* 433, 1230; at Tapa, Waterfall, Maxwell's Hill, &c., *Wray* 1359, 1414, 2661, 3231, 4203; at Goping, Bukit Bingarang, &c., *King's Collector* (*Kunstler*) 168, 307, 1875, 6818. MALACCA: *Cuning* 2368; *Griffith*; *Maingay* (K.D.) 1185; *Hullett* 404; at St. John's Hill, *Hervey*; at Ayer Punas, *Derry* 296. JOHORE: *G. King*. SINGAPORE: *Wallich* (cf. Pl. As. Rar.); *Walker* 257, 288; *G. King*.

3. CLERODENDRON DISPARIFOLIUM, Blume Bijdr. 809 (1826). A shrub or small tree, reaching sometimes 20 ft. or more in height; branches pale brown, lenticellate, obscurely quadrangular; branchlets similar, slender, puberulous. *Leaves* membranous, the pairs more usually equal but occasionally unequal in size; oblong- or elliptic-lanceolate, long-acuminate at apex, acuminate or acute occasionally almost rounded at base; glabrous and pale on both surfaces except sometimes on the midrib beneath; margins entire or undulate, or obscurely toothed; variable in size as in shape, 2 to 7 in. long, .75 to 2.5 in. broad; midrib slender; main nerves 5 to 7 pairs, the lowest from close above the base and at about 20° to 30° with the midrib, the rest distant, starting at 50° to 60° with the midrib and curving upwards to near the margin, the upper ones joining in an intramarginal looped nerve; reticulations distant, transverse, not prominent; petiole slender, variable, .5 to 2.5 in. long, often twisted at base. *Cymes* puberulous, in lax spreading terminal or axillary brachiate panicles; the branches slender, repeatedly trichotomous; terminal ones sometimes up to 6 in. long, axillary ones about 2 to 3 in. long; peduncles very slender; bracts linear, usually about .25 in. long, those of main branches sometimes leafy, caducous after flowering; pedicels filiform, .25 to .5 in. long; buds clavate; flowers pale yellow. *Calyx* reddish; tube campanulate, about .1 in. long; lobes as long as tube, triangular, acute, prominently nerved; the calyx enlarged in fruit to about .5 in. long, with dark red reflexed lobes. *Corolla*-tube slender, .5 to .75 in. long, glabrous without, puberulous within; lobes 5, subequal, spathulate, .2 to .25 in. long. *Stamens* exsert. *Ovary* glabrous; style as long as stamens; stigma shortly bifid. *Drupe* globose, succulent, .25 in. in diameter. *Seeds* usually 2 fertile, ovoid; testa thin, wrinkled; cotyledons thick, fleshy; radicle minute. Schauer in DC. Prodr. XI. 672; Hassk. *Retzia* i. 57; Miq. Fl. Ind. Bat. II. 871; Clarke in Hook. f. Fl. Br. Ind. IV. 589; Koord. & Val. Bijdr. VII. 212. *C. acuminatum*, Wall. Cat. 1792; Schauer *l. c.* 662; Miq. *l. c.* 869. *C. Jackianum*, Wall. Cat. 1794, and in Hook. Bot. Misc. I. 284

(note to *C. nutans*, Jack); Bot. Mag. t. 3049 (*in note*); Schauer *l. c.*, 664; Miq. *l. c.* 872.

KEDAH: at Pulau Songsong, *Curtis*. PENANG: at Penara Bukit, *Curtis* 1539. PERAK: *Wray* 1352, 2841; *Curtis* 2043, 3196, 3333; *King's Collector* 751, 879, 2301, 4130, 4331, 4332, 5197?, 8772; *Scortechini* 297, 314, 922. DINDINGS: Pangkore, *Scortechini* 1011; *Curtis* 1638. SELANGOR: *Curtis* 3778. MALACCA: *Griffith*; *Harvey*; *Cuning* 2378, 2395; *Ridley* 378; *Derry* 414; *Holmberg* 810; *Good-enough* 1773. JOHORE: *Cantley* 19. SINGAPORE: *Wallich* 1792 c; *Lobb*; *Ridley*; *G. King*; *Maingay* (K.D.) 1186; *Deschamps*; *Murton* 93; *Walker* 54; *Kunstler* 1, 119.—DISTRIB. Malay Archipelago.

4. CLERODENDRON LANKAWIENSE, King & Gamble in Kew Bull. 110 (1908). A shrub; branchlets scabrid-puberulous, obtusely quadrangular, channelled. *Leaves* chartaceous, opposite; oblong-lanceolate or oblanceolate, acute at apex, attenuate at base; both surfaces sparsely glabrous-hispid, pubescent on the nerves beneath; margins entire; 3 to 4 in. long, .5 to 1 in. broad; midrib stout; main nerves 8 to 10 pairs, curving acutely upwards to and along the margin; transverse nervules few, irregular; reticulations netted; petiole .25 in. long, scabrid-pubescent. *Panicle* leafy, terminal, pyramidal, thyrsoïd, reaching 10 in. in length and 4 in. in diam., scabrid-pubescent; branches at about 1 in. intervals, pedunculate, ending in rather few-flowered trichotomous cymes; bracts leaf-like, lanceolate; bracteoles small, setaceous; pedicels slender, about .2 in. long; buds clavate up to .75 in. long. *Calyx* campanulate, scabrous-hispid without, glabrous and with large peltate glands within, cleft about two-thirds down, prominently nerved; lobes ovate, acute, .2 to .25 in. long, .1 in. broad at base. *Corolla*-tube slender, pubescent, cylindric, .5 in. long; lobes spreading, obovate, the midlobe of the lower lip longer than the rest. *Stamens* long-exsert; filaments very slender, glabrous; anthers oblong, .075 in. long; cells parallel. *Ovary* rounded, obtuse; style very slender; stigmatic lobes very short. *Fruit* not seen.

KEDAH: at Terutau on Langkawi Island, *Curtis* 3789.

Only one specimen of this species is available. It is near *C. Griffithianum*, Clarke, but differs in the inflorescence, calyx, &c.

5. CLERODENDRON PENDULIFLORUM, Wall. Cat. 1795 (1828). A shrub; branchlets pale-brown, pubescent, quadrangular. *Leaves* membranous, opposite or ternate; ovate or lanceolate or oblong-lanceolate, long-acuminate at apex, acute at base; glabrous on both surfaces, glaucescent on the lower; margins entire or sometimes crenulate; 5 to 8 in. long, 1 to 3 in. broad; midrib slender; main nerves 5 to 7

pairs, distant, at once curving upwards to and along the margin; reticulations distant, obscure; petiole $\cdot 5$ to 2 in. long, slender, channelled. *Panicle* elongate, very lax, usually pendulous, glabrous or puberulous, long-pedunculate, reaching about 15 in. in length and up to 4 in. in greatest diameter; branches distant, opposite, bearing few-flowered umbellate cymules on slender peduncles $\cdot 5$ to 1 in. long; bracts linear, subulate, $\cdot 15$ to $\cdot 2$ in. long; pedicels slender, $\cdot 1$ to $\cdot 15$ in. long; flowers white; the rachis and calyx red. *Calyx* glabrous, deeply lobed; tube $\cdot 1$ in. long; lobes oblong-lanceolate, acute, $\cdot 3$ in. long; somewhat enlarged, reddish and reflexed in fruit. *Corolla*-tube funnel-shaped, curved, slender, $\cdot 5$ in. long, slightly glandular-pubescent; lobes oblong-spathulate, rounded, the 2 lower slightly emarginate, about as long as the tube. *Stamens* exsert; anther-cells incurved so as slightly to overlap. *Ovary* cylindric, truncate; style slender; stigma shortly 2-fid. *Drupe* fleshy, globose, $\cdot 25$ to $\cdot 35$ in. in diam.; pyrenes 4, thin-walled. *Seed* usually one only; testa membranous, rugose; cotyledons thick, fleshy. Schauer in DC. Prodr. XI. 664; Clarke in Hook. f. Fl. Br. Ind. IV. 591; Bot. Mag. t. 3049 (*in note*).

PENANG: at Penara Bukit and base of Penang Hill, *Ridley* 6947, 7181; *Curtis*; *Deschamps*. PERAK: at Batu Kuran, *Scortechini* 1612. SELANGOR: Caves, Gua Batu, *Ridley* 8212.—DISTRIB. Burma (Arracan (*Kurz*), Tenasserim (*Helper* (K.D.) 6047), Tavoy (*Wallich* 1795)), Nicobar Islands.

6. CLERODENDRON UMBRATILE, King & Gamble in Kew Bull. 110 (1908). A shrub or small tree, reaching 8 to 15 ft. in height; branchlets pale-brown, smooth, fistular. *Leaves* membranous; variable in shape, usually oblong or obovate or oblanceolate, the broadest part about two-thirds up or even higher, long and rather suddenly acuminate at apex, usually rounded but sometimes attenuate at base; glabrous on both surfaces; entire; 8 to 16 in. long, 2 to 6 in. broad; midrib rather slender; main nerves 8 to 12 pairs, slender, the lowest pair usually from the base at an acute angle with the midrib, the rest at a wider angle curving upwards, the upper ones joining in a looped intramarginal nerve; transverse nervules irregular; reticulations netted; petiole 1 to 3 in. long, flaccid. *Panicles* from the uppermost axils, elongate, lax, somewhat curving, glabrous, usually 4 to 6 in. long and about 3 in. broad, on slender peduncles 4 to 7 in. long; branches divaricate, usually at right angles, with few-flowered cymules; rachis flattened and slightly winged; bracts leafy, lanceolate, up to 1 in. long; bracteoles many, linear-setaceous; pedicels slender, puberulous, $\cdot 1$ to $\cdot 5$ in. long; buds spathulate, curved, 1 in. long; flowers rather large, white tinged with pink; the calyx white or pale green turning red in fruit. *Calyx* large, glo-

bose or slightly puberulous, deeply divided nearly to the base; lobes ovate-acuminate, cuspidate, about .6 in. long by .25 in. broad, enlarging in fruit to 1.5 in. in diam., and then spreading. *Corolla*-tube slender, cylindric, .4 to .6 in. long; lobes spathulate, rounded at top, as long as tube. *Stamens* exsert; filaments glabrous; anthers .1 in. long; cells parallel. *Ovary* rounded, obtuse; style very slender; stigmas 2, short. *Drupe* black, smooth, fleshy, globose, .5 in. in diam.; pyrenes 4 or less, triangular-convex; endocarp crustaceous. *Seeds* rounded, .25 in. in diam.; testa membranous; cotyledons fleshy; radicle minute.

PERAK: at Kapayong Kinta, *Wray* 167; in dense jungle up to 3500 ft., *King's Collector* 722, 6959, 8268; *Scortechini* 2198; on Larút Hills, 3000 ft., and in Thaiping Hills, *Derry* 3704 (*Curtis*), 10712; at Kwala Dipang, *Curtis* 3116; at Bujong Malacca, *Ridley* 9700.—*DISTRIB.* Sumatra (in deep shade of forest at Grenoeng Trang and Kotta Djawa, Lampongs, *Forbes* 1333, 1585).

Ridley's No. 7594, from Ginting Bidai, Selangor, appears to be this species, but the leaves are rather narrower than usual and reach 12 in. long by 2.5 in. broad. The specimen is in fruit, which Ridley describes as black with a red calyx.

7. CLERODENDRON MYRMECOPHILUM, Ridley in Journ. Bot. XXXIII. 42 (1895). A sparingly branched shrub, about 3 ft. high; stem stout, terete, glabrous, fistular, the bark white; internodes swollen, hollow. *Leaves* opposite or alternate, membranous when dry; oblong, elliptic-oblong or -oblanceolate, acute or obtuse at apex, acute obtuse or cordate at base; both surfaces glabrous, dull; margins entire; 6 to 12 in. long, 2 to 4 in. broad; midrib stout, broad, pale on the upper surface; main nerves 10 to 13 pairs, curving very gently upwards to meet in a looped intramarginal nerve; transverse nervules very few, irregular; reticulations not visible; petiole 7.5 to 2.5 in. long, fistular. *Panicle* a terminal, shortly peduncled, pubescent, pyramidal thyrsus reaching 10 in. long and 3 to 4 in. broad; branches usually opposite, spreading, of rather few-flowered loose reddish-brown cymes; bracts and bracteoles linear-subulate, caducous reddish-brown; pedicels .15 to .2 in. long; buds clavate, curved; flowers ochreous-red. *Calyx* puberulous, about .3 in. long, cleft nearly to the base; lobes erect, lanceolate acuminate with incurved tips; fruiting calyx enlarged to about 1 in. in diam; lobes triangular-acuminate, reflexed, red. *Corolla*-tube cylindric, about .5 in. long, puberulous without; lobes as long as tube, obovate-oblong; the tips rounded. *Stamens* long exsert; filaments very slender, red; anthers oblong-reniform, .05 in. long; cells parallel. *Ovary* glabrous, obtuse; style as long as stamens, red; stigmatic branches slender. *Drupe*

globose, black, .5 in. in diam., with 4 to 1 pyrenes; pyrenes convex on back, nearly plane on the face, 3-ribbed, .3 to .4 in. long. *Seed* conform with the pyrenes; testa membranous; cotyledons thick, fleshy, unequal; radicle minute. Bot. Mag. t. 7887; Gard. Chron. XXXIII. Ser. 3, 196 (1903), and XXXV. Ser. 3, 237, t. 98 (1904).

JOHORE: at Jaffaria, *G. King*. SINGAPORE: in dense wet woods at Choa-Chu-kang, *Ridley*.

The hollow stems are swollen at the internodes, and there form nests for ants belonging to the genus *Pheidole*, Fabricius. The same phenomenon occurs in *C. fistulosum*, Becc., of Borneo, in *C. formicarum*, Gürke, a native of Tropical Africa (Hook. f. in Bot. Mag. l. c.), and in the next species here described.

8. CLERODENDRON CURTISII, H. H. W. Pearson in Kew Bull. 142 (1901). A small shrub, usually 2 to 3 ft., sometimes reaching 6 ft. high; stem thick, fistular, striate, minutely puberulous. *Leaves* opposite, membranous; elliptic, elliptic-oblong or -obovate, acuminate at apex, broadly cuneate rounded or sometimes slightly cordate at base; both surfaces somewhat puberulous, upper glabrescent when old; margins entire or undulate-denticulate; 4 to 12 in. long, 3 to 6 in. broad; midrib stout, pubescent; main nerves 9 to 12 pairs, curving upwards to and along the margin where they anastomose; transverse nervules fairly regular and prominent; reticulations inconspicuous; petiole thick, striate, puberulous, 1 to 4.5 in. long. *Panicles* terminal, thyrsoïd, pubescent, much-branched, reaching 6 to 8 in. long and 4 to 5 in. broad; the rachis and branches angular; branches opposite, with peduncles .75 to 1 in. long and corymbose cymes of many flowers; bracts leafy, the lower large, the upper obovoid or spatulate; bracteoles small, subulate; pedicels slender, .15 in. long; buds clavate, .5 to .75 in. long; flowers bright yellow, tinged with red; the calyx crimson. *Calyx* cleft three-quarters down; lobes lanceolate, acute, 3-nerved, pubescent, ciliate, .25 in. long, .1 in. broad, with usually several rather obscure peltate glands. *Corolla*-tube cylindric, slender, .5 to .7 in. long, puberulous, glandular; lobes obovate or elliptic, narrow at the base, .2 to .3 in. long. *Stamens* long-exsert; filaments glabrous; anthers reniform, under .05 in. long; cells parallel. *Ovary* glabrous, obtuse; style very slender; stigmatic branches short. *Drupe* not seen.

PERAK: at Kota, *Wray* 3246; Lamjibus, *Scortechini* 1555; on Larút Hills, 3000 ft., *Derry* (*Curtis*) 3704; in low swampy places at Larút, *King's Collector* (*Kunstler*) 1966, 2507. DINDINGS: Bruas, in damp places, *Curtis* 3441. SELANGOR: Klang, *Ridley* 10198.

Mr. *Ridley* informs us that this is the same plant as *Clerodendron breviflorum*, *Ridley* in Journ. Bot. XXXII. 43 (1895), which was described from specimens

collected at Kampong Chin-Chin, Ula Batu Pahat, Johore, by Lake & Kelsall in 1892. Unfortunately, there are no specimens in the herbaria at Kew or Calcutta, so we hesitate to alter the name. If the identification proves correct, it is Ridley's name that must take precedence. This is one of the species whose fistular stems contain ants' nests. *C. macrophyllum*, Hook. MS. in Herb. Kew, a large-leaved, handsome species from Java and Borneo, is very closely allied to this species.

9. CLERODENDRON SERRATUM, Spreng. Syst. Veg. II. 758 (1825); Don Prodr. Fl. Nep. 103; Wall. Cat. 1809; Ham. in Trans. Linn. Soc. XVII. 187; Schauer in DC. Prodr. XI. 664; Dalz. & Gibs. Bomb. Fl. 200; Wight Ic. t. 1472; Brandis For. Fl. 364; Kurz For. Fl. II. 267; Blume Bijdr. 810; Miq. Fl. Ind. Bat. II. 873; Clarke in Hook. f. Fl. Br. Ind. IV. 592; Trimen Fl. Ceyl. III. 360; Cooke Fl. Bomb. II. 432; Prain Beng. Plants 835. *C. ternifolium*, Don l. c. *C. macrophyllum*, Sims Bot. Mag. t. 2536; Reich. Fl. Exot. t. 209; Schauer l. c. 674. *C. ornatum*, Wall. Cat. 1811; Schauer l. c. 675. *C. herbaceum*, Wall. Cat. 1815; Schauer l. c. 675. *Volkameria serrata*, Linn. Mant. 90; Roxb. Fl. Ind. III. 62. *V. herbacea*, Roxb. Hort. Beng. 46.—DISTRIB. India, Burma, and Ceylon.

VAR. *Wallichii*, C. B. Clarke in Hook. f. Fl. Br. Ind. IV. 592. A shrub, reaching 8 to 10 ft. in height (*Kunstler*); branches somewhat herbaceous, smooth, fistular; branchlets smooth, angled and with raised lines decurrent from the nodes. *Leaves* opposite, almost membranous when dry; obovate-lanceolate or oblanceolate, shortly acuminate at apex, acuminate narrowed at base; both surfaces glabrous; margins distantly serrate or denticulate, sometimes entire; 4 to 8 in. long, 1.5 to 3 in. broad; midrib strong, prominent beneath; main nerves 6 to 10 pairs, at first straight, then curving upwards to and along the margin; reticulations irregular; petiole up to about .6 in. long or none when bordered by the decurrent margins of the blade. *Panicle* terminal, erect, elongate, minutely pubescent, reaching 10 to 12 in. in length and 2 to 2.5 in. in breadth; the branches many, divaricate, subdichotomous, many-flowered; bracts foliaceous, large, ovate or obovate, acuminate or obtuse and apiculate; bracteoles many, lanceolate or finally linear; pedicels slender, about .1 in. long; buds spathulate, curved; flowers greyish-white to blue, the lower lobe darker than the rest. *Calyx* campanulate; lobes extremely short, rounded, minutely apiculate; the fruiting calyx cup-shaped, almost truncate, not enlarged. *Corolla*-tube cylindric, slightly narrowed below the oblique throat, .2 to .25 in. long, glabrous without, villous within; lips 2, upper of 2 oblong, flat, obtuse lobes, lower of 3 lobes, the side ones similar to the upper, the midlobe spathulate, concave, emarginate, all about .25 in. long. *Stamens* very long-exsert, much curved; filaments villous at the base and

thickened; anthers oblong, .075 in. long; cells parallel. *Ovary* glabrous, truncate at top; style very long, slender; stigmas 2, rather long. *Drupe* purple, succulent, when dry .25 in. long, and as much broad at top, with 4 (or less) well-marked pyrenes; pyrenes obovoid, plane or concave on inner faces; endocarp crustaceous. *Seeds* obovoid, .15 to .2 in. long, concave on the inner, convex on the outer face, which is wrinkled; testa thin; cotyledons fleshy, unequal, one convex, the other concave; radicle minute. *C. farinosum*, Wall. Cat. 1810 (not *Volkameria farinosa*, Roxb.). *C. divaricatum*, Jack in Mal. Misc. I. 2, and in Hook. Bot. Misc. II. 89; Schauer in DC. Prodr. XI. 674.

PERAK: *Wray* 1871; at Ipoh, *Curtis* 3198, 3328; at Ipoh and Baton Gaja, *Deschamps*; near Thaiping, *Scortechini* 507; at Goping, *King's Collector (Kunstler)* 480. SELANGOR: *Goodenough* 10478; *Cecil C. Smith*.—DISTRIB. India (Sikkim, Assam and Burma), Sumatra, Java, Celebes, Cambodia.

We have not followed Clarke in quoting *C. javanicum*, Walp. Rep. IV. 113, as we consider the description therein given does not sufficiently fit our specimens.

10. CLERODENDRON INFORTUNATUM, Linn. Sp. Pl. 637 (1753). A shrub, usually about 3 to 8 ft. high, occasionally a small tree, gregarious; branchlets obtusely quadrangular, slightly furrowed, clothed with yellowish pubescence. *Leaves* somewhat coriaceous; ovate, acuminate at apex, rounded or cordate at base; both surfaces roughly strigosely hairy, lower sometimes with small obscure round glands; margins dentate or denticulate, rarely entire; 4 to 10 in. long, 3.5 to 8 in. broad; midrib prominent; main nerves also prominent, about 8 pairs, the lowest two pairs near the base spreading, the rest gradually curving upwards, all joined by prominent transverse nervules which branch and anastomose; reticulations netted; petiole 1 to 4 in. long, densely pubescent. *Panicle* terminal, pyramidal, spreading, 6 to 12 in. long and broad, densely tawny-pubescent; the branches trichotomous, ending in many-flowered cymules; bracts leafy, ovate-lanceolate, deciduous; bracteoles lanceolate, also deciduous; pedicels slender, .25 to .5 in. long; buds clavate, rounded at top; flowers white, tinged with pink; the calyx red at the base (Ic. Roxb.). *Calyx* cleft nearly to the base, silky pubescent, often with scattered, large, round, peltate glands; the lobes lanceolate, acute, suberect, .3 to .4 in. long; fruiting calyx enlarged, crimson, reaching 1.5 in. in diam. when spread out. *Corolla* densely pubescent without; tube cylindric, slender, .5 to .75 in. long; lobes spreading, as long as the tube, the 2 upper somewhat spatulate, the 3 lower ovate, oblong, rounded. *Stamens* long-exsert; filaments glabrous; anthers oblong; the cells parallel. *Ovary* rounded, glabrous;

style slender; stigmas 2, short. *Drupe* nearly globose, shining, black, 3 in. in diam., with 4 to 1 pyrenes; pyrenes convex without; the endocarp crustaceous. *Seeds* conform to the drupe; testa membranous; cotyledons fleshy. Gaertn. Fruct. I. 271, t. 57, fig. 1; Lamk. Ill. t. 544; Wall. Cat. 1796; Schauer in DC. Prodr. XI. 667; Dalz. & Gibs. Bomb. Fl. 200; Wight Ic. t. 1471 (?); Bedd. Fl. Sylv. CLXXXIII., and Anal. XXII. fig. 1; Brandis For. Fl. 363; Kurz For. Fl. II. 267; Miq. Fl. Ind. Bat. II. 876; Trimen Fl. Ceyl. III. 361; Clarke in Hook. f. Fl. Br. Ind. IV. 594; Cooke Fl. Bomb. II. 432; Prain Beng. Plants 835. *C. viscosum*, Vent. Jard. Malm. t. 25; Bot. Mag. t. 1805; Bot. Reg. t. 629. *C. cordatum*, Don Prodr. Fl. Nep. 103; Schauer l. c. 674. *Volkameria infortunata*, Roxb. Fl. Ind. III. 59. *Clerodendron*, Linn. Fl. Zeyl. 232; Burm. Thes. Zeyl. 66.

SIAMESE STATES: Poongah, Curtis 2949. SINGAPORE: Schomburgk 106.—DISTRIB. India, Burma, Ceylon, Java, Moluccas.

We have not quoted "*Peragu*," Rheede Hort. Mal. II. t. 25, which Clarke & Miquel consider to be this species. Schauer quotes it under *C. villosum*, and it seems to us to resemble that species more closely in the leaves and calyx. *C. villosum* has not hitherto been recorded from the Western Peninsula, but Gamble has specimens collected in the Wynaad region of the Nilgiris which seem to be it and not *C. infortunatum*. We do not feel very sure that the plant figured in Wight Ic. t. 1471 is not *C. villosum* rather than *C. infortunatum*.

11. CLERODENDRON VILLOSUM, Blume Bijdr. 811 (1826). A shrub, usually about 3 to 5 ft. high (10 to 15 ft., *King's Collector*; 15 to 20 ft., *Kurz*); branchlets stout, obtusely quadrangular, densely tawny-villous, channelled on the sides. *Leaves* chartaceo-coriaceous; ovate acuminate at apex, cordate or truncate at base, sometimes slightly cuneate; both surfaces tawny-villous or velvety tomentose, those of young leaves white-silky; margins entire; 4 to 8 in. long, 3 to 5 in. broad; midrib stout, prominent; main nerves 5 to 6 pairs, the lowest pair from the base spreading at right angles to the midrib with about 8 to 10 nerves from the lower side, the next pair from close above it curving upwards with also about 8 to 10 nerves from the lower side, the rest more distant and similarly curving; transverse nervules distant, pale; reticulations obscure; petiole 2 to 6 in. long, densely tawny-pubescent. *Panicle* terminal, pyramidal, thyrsoid, spreading, reaching 4 to 7 in. long and 6 in. broad, densely tawny-pubescent; branches long peduncled, ending in trichotomous cymes of rather few flowers; bracts leafy, ovate-lanceolate, acuminate, persistent; bracteoles many, small, lanceolate, deciduous; pedicels .1 to .2 in. long; buds short, clavate, rounded; flowers white or cream-coloured, tinged with red. *Calyx* cleft about

two-thirds down, with large prominent, scattered, rounded glands; lobes ovate-lanceolate, cuspidate-acuminate, .25 in. long; fruiting calyx white, much enlarged, nearly 1 in. in diam. when opened, completely embracing the fruit. *Corolla* villous; tube cylindric, .2 to .3 in. long; lobes obovate-oblong, as long as tube. *Stamens* long-exsert; filaments slender; anthers oblong-reniform; cells parallel. *Ovary* glabrous, obtuse; style slender, longer than the stamens; stigmatic lobes 2 very short. *Drupe* globose, shining, black when ripe (*King's Collector*), white (*Jack*), slightly succulent, with 4 to 1 pyrenes; pyrenes convex on the outer, flattened on the two inner, faces, .25 in. long; endocarp crustaceous, reticulate. *Seeds* oblong, curved, .15 to .2 in. long; testa thin; cotyledons fleshy, curved, somewhat unequal; radicle minute. Schauer in DC. Prodr. XI. 667; Kurz For. Fl. II. 268; Miq. Fl. Ind. Bat. II. 877; Clarke in Hook. f. Fl. Br. Ind. IV. 595. *C. molle*, Jack in Mal. Misc. I. 15, and in Hook. Bot. Misc. I. 283 (not of H. B. K.). *C. velutinum*, Wall. Cat. 1797. *C. trichotomum*, Wall. Cat. 6315 B (not of Thunb.).

PENANG: *Curtis* 101; roadsides on the hill, *Deschamps*; near top of the hill, *G. King*. PERAK: *Scortechini* 1389; in open forests, at 100 to 300 ft. alt., *King's Collector* (*Kunstler*) 5191, 5647, 8831. DINDINGS: Pangkore, *Scortechini* 63. MALACCA: *Griffith* 6051; *Main-gay* (K.D.) 1187; *Hervey*; *Derry* 148. SINGAPORE: *Cuming* 2415; *Wallich* 1797; *Murton* 124; *Schomburgk* 66; *Kurz*; *G. King*; *Deschamps*.—DISTRIB. Burma (Martaban, fide *Kurz*; *Mergui*, *Griffith*), Java, Sumatra; Philippines.

12. CLERODENDRON COLEBROOKIANUM, Walp. Rep. IV. 114 (1844). A large shrub, sometimes a small tree with silver-grey bark; branchlets glabrous, or the uppermost pubescent, quadrangular, furrowed below the leaf-petioles, more or less fleshy and soft; innovations tawny-pubescent. *Leaves* membranous when dry, opposite; broadly ovate, acute at apex, cordate at base, the sinus rather broad; both surfaces glabrous except the nerves beneath which are puberulous, a few large glands on the lower surface especially near the apex of the petiole; margins entire or sinuate; 5 to 12 in. long, 4 to 10 in. broad; midrib prominent; main nerves 8 to 10 pairs, the lowest pair from just above the petiole, with about 5 to 6 branch-nerves on the outer side, all spreading and curving only close to the margin; transverse nerves faint, as are the netted reticulations; petiole 2 to 8 in. long, cylindric, smooth. *Panicles* large, spreading, terminal, pubescent, reaching 1 to 2 ft. in diam.; branches long-peduncled, ending in corymbose, close, many-flowered cymes; bracts lanceolate, caducous; bracteoles many, lanceolate; pedicels short, .1 to .2 in. long; buds clavate, often 1 in.

long; flowers white to rose-purple. *Calyx* pubescent, .15 to .25 in. long, cleft half-way down; tube with often a large gland under each lobe; lobes triangular-lanceolate, acute; fruiting calyx scarcely enlarged. *Corolla*-tube cylindric, slender, nearly glabrous, .75 to 1 in. long; lobes elliptic or obovate, .25 in. long. *Stamens* long-exsert; filaments glabrous; anthers oblong-reniform, .075 in. long; cells parallel. *Ovary* glabrous, obtuse; style very long and slender; stigmatic lobes 2, short. *Drupe* glabrous, blue, .3 to .35 in. in diam. with usually 4 pyrenes. Schauer in DC. Prodr. XI. 672; Clarke in Hook. f. Fl. Br. Ind. IV. 594. *C. glandulosum*, Colebr. MS. ex Wall. Cat. 1806; *vide* Walp.; Lindl. in Bot. Reg. t. 19 (1844) *in note*; Schauer *l.c.*

SINGAPORE: *Lobb*.—DISTRIB. India (Sikkim, Assam, Burma). It is not quite certain that it is really indigenous in the Peninsula; *Lobb's* specimen may have been from a cultivated plant.

VAR. *Forbesii*, King & Gamble. Leaves and branchlets puberulous; panicles reduced to a terminal corymb of closely packed flowers 4 to 5 in. long; no glands on calyx or midrib of leaf; flowers dark scarlet.

Sumatra (near Kagoengan Ratoe, Lampongs, at 500 ft. alt., *Forbes* 1786).

13. CLERODENDRON PANICULATUM, Linn. Mant. 90 (1771). A shrub, reaching 4 to 6 ft. in height; branchlets quadrangular, channelled below the leaf-petioles, glabrous or puberulous, the bases of the leaves (as also the branches of the inflorescence) joined at the nodes by a belt of soft brown hairs. *Leaves* membranous; variable in shape, usually orbicular or ovate, from almost simple to deeply 3- to 7-lobed, cordate or hastate at base, acuminate at apex and at the apices of the lobes; upper surface sparsely hispid or glabrescent, lower pale and densely covered with round peltate glands; margins entire or minutely denticulate; 4 to 8 in. in diam.; midrib stout, ribs usually 3 pairs radiating from the base, the lower deflexed; main nerves of middle lobe 5 to 6 pairs, of side lobes about the same but stronger on the lower side; reticulations slender, netted; petiole variable, 1 to 6 in. or more. *Panicles* terminal, thyrsoïd, pyramidal, spreading, 4 to 12 in. long by 3 to 8 in. broad, with opposite branches bearing trichotomous cymes with racemose reddish branches, the rhachises channelled; bracts foliaceous, like the leaves but smaller; bracteoles small, linear, numerous, red; pedicels slender, red, .25 to .75 in. long; buds clavate, the head globose; flowers red, orange or almost white; the calyx red. *Calyx* divided nearly to the base; lobes oblong-lanceolate, acute, .15 to .2 in. long, much enlarged in fruit, stellate, the lobes closely embracing the drupe. *Corolla*-tube slender, cylindric, puberulous, .5 to .7 in. long; lobes nearly equal, elliptic, .2 to .4 in. long, patent. *Stamens* long exserted; filaments red, glabrous;

anthers oblong-reniform; cells parallel. *Ovary* glabrous, cylindrical; style very slender; stigmatic branches short. *Drupe* obovoid, 1- to 4-pyrened (usually 1 only); pyrenes pyriform; endosperm crustaceous, reticulate. *Seeds* conform to the pyrene; testa membranous; cotyledons unequal, fleshy; radicle very small. Ait. Hort. Kew. ed. 2, IV. 64; Vahl Symb. II. 74; Bot. Reg. t. 406; Reichb. Fl. Exot. t. 208; Hassk. Pl. Jav. Rar. 488; Schauer in DC. Prodr. XI. 668; Blume Bijdr. 811; Miq. Fl. Ind. Bat. II. 879; Clarke in Hook. f. Fl. Br. Ind. IV. 593; Hook. f. Bot. Mag. t. 7141. *C. pyramidale*, Andr. Bot. Rep. t. 628; Wall. Cat. 1802. *C. splendidum*, Wall. Cat. 1803. *Volkameria angulata*, Lour. Fl. Cochinch. 389.

KEDAH: on low ground near sea-level, *King's Collector* (*Kunstler*) 1792. PENANG: *Wallich* 1802; at Tanjong Bunga, *Curtis* 313. PERAK: *Wray* 42, 2435; at L. W. Resthouse, *Scortechini* 915; at Ipoh, *Deschamps*; at Larut, on rocks at 300 to 800 ft. alt., *King's Collector* 6437. SELANGOR: gap on Pahang side, at 2000 to 3000 ft. alt., *Curtis* 3759. MALACCA: *Griffith* 6050. SINGAPORE: *Ridley*; gardens, hedges, and waste places, *Deschamps*; Bukit Mandai, *Goodenough*.—DISTRIB. Siam (*Hemsley* in Journ. Linn. Soc. XXVI. 262).

14. CLERODENDRON SIPHONANTHUS, Br. in Ait. Hort. Kew. ed. 2, IV. 65 (1812). An erect, usually single-stemmed, little-branched shrub, reaching 4 to 8 ft. in height; branchlets channelled, smooth-barked. *Leaves* membranous when dry, verticillate, 3- to 5-nate or opposite, the bases of the petioles joined by a pubescent ring; narrowly lanceolate or oblong-lanceolate, shortly acuminate at apex, attenuate at base; both surfaces glabrous, the lower pale; margins entire or sinuate, recurved; 4 to 8 in. long, .5 to 1 in. broad; midrib prominent; main nerves 10 to 12 pairs, very short, straight, joining prominent looped intramarginal nerves which start from the base; transverse nervules very few; petiole none or extremely short. *Panicle* terminal, thyrsoïd, leafy, reaching 8 to 18 in. in length, and 4 to 6 in. in diam.; branches red, verticillate, of lax peduncled few-flowered cymes; bracts linear-lanceolate, .5 in. long; bracteoles subulate; pedicels .5 to 1.5 in. long, puberulous; buds long, clavate; flowers white, changing to cream-colour. *Calyx* puberulous, divided three-fourths down; lobes ovate-lanceolate, acute, densely clothed within with minute round glands, .3 to .4 in. long, .15 in. broad; fruiting calyx greatly enlarged, leathery, up to 1.5 in. in diam., crimson. *Corolla*-tube funnel-shaped, glabrous, curved, 3 to 4.5 in. long, about .1 in. broad below, widening above; lobes spreading, obovate- or oblong-obtuse, .3 to .4 in. long. *Stamens* long exsert; filaments slender, glabrous; anthers oblong, .1 to .15 in. long; cells parallel. *Ovary* glabrous, obtuse; style very long, slender;

stigmatic branches short, rather thick. *Drupe* 1- to 4-lobed according to the number of pyrenes, about .5 in. in diam.; exocarp fleshy, dark blue; pyrenes rounded except a slight flattening on the inner side, smooth, .4 in. by .25 in.; endocarp crustaceous. *Seeds* conform to the pyrenes; testa thin, soft; cotyledons very fleshy; radicle very small. Wall. Cat. 1784; Wight Ill. t. 173; Schauer in DC. Prodr. XI. 670; Brandis For. Fl. 364; Dalz. & Gibs. Bomb. Fl. Suppl. 69; Miq. Fl. Ind. Bat. II. 883; Clarke in Hook. f. Fl. Br. Ind. IV. 595; Cooke Fl. Bomb. II. 433; Prain Beng. Plants 836. *C. verticillatum*, Don Prodr. Fl. Nep. 102; Schauer l.c. 671. *Siphonanthus indica*, Willd. Sp. Pl. I. 606; Lamk. Ill. t. 79, fig. 1; Roxb. Fl. Ind. III. 67. *S. angustifolia*, Willd. l.c. *Ovieda mitis*, Burm. Fl. Ind. 136, t. 43, figs. 1, 2.

PERAK: at Trong, Wray 3170.—DISTRIB. India, Burma, Java, Sumatra, Celebes, Siam (*Schomburgk* 302). Often cultivated in gardens.

15. CLERODENDRON RIDLEYI, King & Gamble in Kew Bull. 111 (1908). A small slender tree, reaching 15 ft. in height and 2 to 3 in. in diam.; branches smooth, pale brown; branchlets (also rachis of inflorescence) quadrangular, shining. *Leaves* opposite, membranous; elliptic, elliptic-lanceolate or ovate, caudate-acuminate at apex, rounded or cuneate at base; both surfaces glabrous, the lower pale; margins entire; 3 to 7 in. long, 1 to 3 in. broad; midrib slender, prominent beneath; main nerves 5 to 7 pairs, the lowest pair from close to the base at an acute angle with the midrib, the rest more spreading, meeting in a looped intramarginal nerve; transverse nervules few, irregular, other reticulations not visible; petiole slender, .75 to 2 in. long, winged by decurrent ridges from the base of the blade. *Panicle* terminal, few-flowered, reaching with the peduncle at most 6 in. long and 3 in. broad; branches divaricate, 1 to 1.5 in. long; bracts leafy, lanceolate, acuminate, caducous; bracteoles linear; pedicels slender, .25 in. long; buds very long, clavate; flowers white (*Ridley*) or pale yellow (*Kunstler*). *Calyx* erect, deeply divided; lobes glabrous, lanceolate, caudate-acuminate, .5 to .7 in. long, often with scattered large peltate glands; fruiting calyx enlarged, enclosing the fruit, 1.5 in. in diam. when opened out, deep red in colour. *Corolla*-tube cylindric, slightly funnel-shaped at top, 3 to 3.5 in. long, very slender; lobes obovate, obtuse, .5 in. long, subequal. *Stamens* long-exsert; anther-cells parallel. *Ovary* glabrous, obtuse, 4-lobed; style very long, slender; stigmatic lobes very short. *Drupe* deep red, smooth, globose, fleshy, .5 in. in diam. with 4 to 1 pyrenes; pyrenes pyriform, slightly ribbed; endocarp crustaceous. *Seeds* conform to the pyrenes; testa membranous; cotyledons very thick, fleshy.

PERAK: in dense forest near Larút, up to 300 ft., *King's Collector* 2944, 3988. SELANGOR: at Batu Tiga, *Ridley* 11862.

CLERODENDRON LOBBII, C. B. Clarke in Hook. f. Fl. Br. Ind. IV. 590 (1885), is a climbing shrub which, in all probability, does not belong to this genus. Mr. Ridley informs us that it is very common in Borneo, and that he thinks Lobb's specimen must have been collected at Kuching and not in Penang. It is a very handsome, striking plant, and has been cultivated. It has the upper leaves of the spray bright red, flowers of a light salmon-red, and a horn-shaped fruit about 2 in. long. There is a good picture of it in Miss North's Gallery at Kew, to which Mr. Ridley has drawn our attention.

10. VITEX, Linn.

Trees or shrubs. *Leaves* opposite, digitately 3- to 7-foliolate, sometimes 1-foliolate; leaflets usually entire, sometimes dentate, generally petiolulate. *Flowers* blue, white or yellow, in sessile or pedunculate cymes forming terminal or axillary or both terminal and axillary panicles or corymbs; bracts usually small, often caducous. *Calyx* campanulate or tubular funnel-shaped, usually truncate or shortly 5-toothed, sometimes bilabiate with 3 to 5 teeth. *Corolla* small, 2-lipped; tube long or short; upper lip usually of 2, lower of 3, lobes, the central lobe of the lower lip much the longest. *Stamens* 4 didynamous, usually exerted; anther-cells various, always attached at the tip only, generally parallel at first, afterwards divaricate. *Ovary* 2- to 4-celled, 4-ovuled; style filiform; stigma bifid. *Fruit* a globose or ovoid or obovoid drupe; supported by the more or less enlarged calyx; mesocarp generally fleshy; endocarp a bony pyrene, normally 4-celled and 4-seeded, but often with some of the cells suppressed, the base of the pyrene sometimes hollowed in a cavity. *Seeds* obovate or oblong; albumen 0; cotyledons usually fleshy; radicle inferior.—DISTRIB. About 120 species, in all tropical and warm temperate regions.

Inflorescence terminal, with occasional additional branches in the axils of uppermost leaves:—

Leaves without wings to the petioles:—

Shrubs or small trees; leaves membranous, grey-pubescent beneath:—

- | | | |
|--|-------|-------------------------|
| Leaves 1- to 3-foliolate; margins entire; petiole under 1 in. long; calyx under .1 in. long | .. .. | 1. <i>V. trifolia</i> . |
| Leaves 3- to 5-foliolate; margins sometimes crenate; petiole over 1 in. long; calyx over .1 in. long | .. .. | 2. <i>V. Negundo</i> . |

Trees; leaves chartaceous or coriaceous, not grey-pubescent beneath:—

Leaves 1-foliolate, coriaceous:—

- | | | |
|---|-------|---------------------------|
| Leaves 1.5 to 4.5 in. broad, with a prominent intramarginal nerve; panicle-branches spicate | | 3. <i>V. holophylla</i> . |
|---|-------|---------------------------|

- Leaves 2 to 3 in. broad, no prominent intramarginal nerve; panicle-branches racemose 4. *V. Clarkeana*.
- Leaves 3-foliolate; leaflets petiolulate:—
- Leaves coriaceous; inflorescence of stout panicles up to 8 in. long, the flowers clustered 5. *V. coriacea*.
- Leaves chartaceous; inflorescence of slender panicles, the flowers not clustered 6. *V. siamica*.
- Leaves 3- to 5-foliolate, chartaceous or coriaceous:—
- Leaflets sessile or subsessile; inflorescence densely tawny-pubescent; bracts large, conspicuous .. 7. *V. pubescens*.
- Leaflets petiolulate; inflorescence thinly cinereous-tomentose; bracts very small or none:—
- Leaflets long-acuminate; panicle-branches slender, with few-flowered cymules; corolla-tube without a ring of hairs within 8. *V. heterophylla*.
- Leaflets short-acuminate; panicle-branches stout, with many-flowered cymules; corolla-tube with a ring of hairs within 9. *V. sumatrana*
var. *urceolata*.
- Leaves with winged petioles, the wings broad:—
- Leaflets long-lanceolate, scabrous-dotted, under 2.5 in. broad 10. *V. pteropoda*.
- Leaflets elliptic or elliptic-obovate, over 3 in. broad, not scabrous-dotted 11. *V. per-alata*.
- Inflorescence axillary:—
- Leaves 3- to 5-foliolate, glabrate; cymes peduncled, reaching 4 to 5 in. long 12. *V. glabrata*.
- Leaves 3-foliolate; cymes sessile, under 1.5 in. long:—
- Leaves and cymes densely tawny-pubescent; drupe with a hard-ridged pyrene, having 3 to 4 seed-bearing cells above and an empty cavity below:—
- Calyx-lobes oblong-lanceolate, 2.5 in. long, conspicuous; bracts large, conspicuous; leaves large 13. *V. longisepala*.
- Calyx-lobes short, acute, inconspicuous; bracts minute, caducous; leaves small 14. *V. vestita*.
- Leaves glabrate; cymes sparingly fulvous-hairy; calyx 2-lipped 15. *V. gamosepala*.

We have not maintained Clarke's subgenus *GLOSSOCALYX* because the species *V. gamosepala*, for which it was established, is so very nearly allied to *V. longisepala* and *V. vestita* that, if any subgenus were necessary, it ought to be one which would include these three, so different in inflorescence and fruit from the rest of the genus, and closely allied to *Premna* and *Gmelina*.

1. *VITEX TRIFOLIA*, Linn. Sp. Pl. 638 (1753). A shrub or small tree; bark smooth, pale grey; branchlets quadrangular, covered with an appressed hairy tomentum. *Leaves* membranous; 1- to 3-foliolate; the terminal leaflets sessile or very shortly petiolulate, the lateral leaflets sessile; leaflets elliptic or obovate, or almost orbicular (speci-

ally when 1-foliolate), obtuse or acute at apex, rounded or cuneate (especially the terminal, if 3) at base; upper surface glabrous, lower densely white-tomentose; margins entire; end leaflet 1 to 3 in. long, .5 to 1.25 in. broad, lateral leaflets smaller; main nerves 8 to 12 pairs, inconspicuous; petiole slender, .5 to 1 in. long. *Panicles* terminal, oblong, white-tomentose, reaching 1 to 5 in. in length; the rachis sub-quadrangular; cymes opposite, up to 1 in. long, brachiate; bracts linear, minute; flowers lavender to blue. *Calyx* sessile, campanulate, .075 to .1 in. long; tube ribbed from the teeth, white-tomentose; teeth 5, regular, acute, very small. *Corolla* .25 to .35 in. long; tube scaly-pubescent without, villous within at the insertion of the stamens; upper lip of 2 short rounded lobes, lower of 3 lobes, the lateral lobes .06 in. long, the midlobe longest, .125 in. long, villous, hairy within and usually incurved. *Stamens* exsert; filaments hairy-villous near the base; anther-cells curved. *Ovary* rounded, depressed, glandular-dotted. *Drupe* ellipsoid, depressed at top, .2 in. in diam., slightly ribbed, glandular-dotted, half-enclosed in the somewhat enlarged calyx. Linn. f. Suppl. 293; Lamk. Dict. II. 613; Roxb. Fl. Ind. III. 69; Bot. Mag. t. 2187; Wall. Cat. 1743; Schauer in DC. Prodr. XI. 683; Blume Bijdr. 812; Miq. Fl. Ind. Bat. II. 859; Benth. in Fl. Austral. V. 66; Bedd. Fl. Sylv. CLXXII; Brandis For. Fl. 370; Clarke in Hook. f. Fl. Br. Ind. IV. 583; Trimen Fl. Ceyl. III. 356; Cooke Fl. Bomb. II. 428; Prain Beng. Plants 833; Koord. & Val. Bijdr. VII. 200. *V. ovata*, Thunb. Fl. Jap. 257; Lamk. l. c.; Hook. & Arn. Bot. Beech. Voy. 206, t. 47. *V. repens*, Blanco Fl. Filip. 513. *V. incisa*, Wall. Cat. 1746 (partly, not of Lamk.). *V. Agnus castus* var., Kurz For. Fl. II. 269. "*Lagondium vulgare*," Rumph. Herb. Amb. IV. 48, t. 18. "*Caranosi*," Rheede Hort. Mal. II. t. 11.

PERAK: *Scortechini* 644, 1459. MALACCA: *Griffith*; *Maingay* (K.D.) 1206; *Hervey*. SINGAPORE: at Pulau Obun, *Kunstler* 57. —DISTRIB. India, Ceylon, Malay Archipelago, North Australia, Japan.

2. *VITEX NEGUNDO*, Linn. Sp. Pl. 638 (1753). A large shrub or small tree; bark thin, grey; branchlets quadrangular, covered with an appressed hairy tomentum. *Leaves* membranous; 3- to 5-foliolate, the terminal leaflet petiolulate (up to .75 in. long), the lateral leaflets shortly petiolulate (usually about .25 in.), sometimes nearly or quite sessile; leaflets lanceolate, acuminate at apex, attenuate at base; upper surface nearly glabrous, lower densely white-tomentose; margins entire or sometimes coarsely crenate; end leaflet 2 to 4 in. long, .5 to 1.25 in. broad, lateral leaflets shorter; main nerves about 15 pairs with a few secondary nerves between; petiole slender, 1 to 1.5 in. long, white-tomen-

tose. *Panicles* 1 to 3 together, terminal, oblong-pyramidal, white-tomentose, reaching 12 in. long; the rachis quadrangular; peduncle of each branch variable, 1 to 4 in. long; cymes opposite, reaching 1 in. in length, but usually shorter, brachiate, at first dichotomous; bracts linear, short, the lowest somewhat leafy; flowers blueish-purple. *Calyx* sessile, campanulate; tube .1 to .15 in. long, faintly ribbed, enlarged in fruit; teeth regular, acute, .05 in. long, sometimes slightly cuspidate. *Corolla* .25 to .35 in. long; tube scaly-pubescent and slightly glandular without, villous within at the insertion of the stamens and on the midlobe of the lower lip; upper lip 2-lobed, lobes rounded, recurved; lower lip 3-lobed, the midlobe much the longest and obtuse at tip, lateral lobes spreading. *Stamens* exsert; filaments villous at the base; anther-cells curved. *Ovary* rounded, very slightly glandular. *Drupe* ovoid, depressed at top, .2 in. in diam., slightly ribbed, glandular-dotted. Roxb. Fl. Ind. III. 70; Wall. Cat. 1744; Schauer in DC. Prodr. XI. 684; Wight Ic. t. 519; Bedd. Fl. Sylv. CLXXI; Brandis For. Fl. 369; Miq. Fl. Ind. Bat. II. 890; Clarke in Hook. f. Fl. Br. Ind. IV. 583; Trimen Fl. Ceyl. III. 357; Cooke Fl. Bomb. II. 428; Prain Beng. Plants 833; Koord. & Val. Bijdr. VII. 201. *V. bicolor*, Willd. Enum. Hort. Berol. 660; Schauer l. c. 683; Dalz. & Gibs. Bomb. Fl. 201. *V. arborea*, Desf. Cat. Hort. Paris, 391. *V. paniculata*, Lamk. Dict. II. 612; Roxb. l. c. 71. "*Lagondium litoreum*," Rumph. Herb. Amb. IV. t. 19. "*Bem-nosi*," Rheede Hort. Mal. II. t. 12.

PETANI: at Tomoh, *Machado* (*Ridley* 5813). MALACCA: *Griffith*. SINGAPORE: *Ridley* 4118. — DISTRIB. India, Ceylon, Malay Archipelago. *Ridley* thinks it is probably not really indigenous in the Peninsula.

3. *VITEX HOLOPHYLLA*, Baker in Kew Bull. 25 (1896). A small tree; branches with yellowish-white bark; branchlets also yellowish, shining, obtusely quadrangular; innovations tawny-tomentose. *Leaves* opposite, coriaceous, simple; ovate-lanceolate or ovate-oblong, acuminate at apex, rounded at base; both surfaces glabrous, upper olive-green, lower ferruginous; margins entire; 4 to 12 in. long, 1.5 to 4.5 in. broad; midrib stout, prominent, keeled above; main nerves 7 to 9 pairs at an angle of 70° with the midrib, curving upwards to meet in an intramarginal looped nerve, all slightly impressed above, raised beneath; secondary nerves many, irregular; reticulations prominent, netted; petiole .75 to 1.5 in. long, prominently jointed at both ends, younger ones puberulous. *Cymes* in terminal panicles of rather long glomerulate spikes reaching 6 to 7 in. long and 3 to 4 in. broad; densely tawny-tomentose when young, afterwards glabrate; bracts lanceolate or elliptic-lanceolate, caducous, .1 to .2 in. long; bracteoles 2, much smaller; flowers in each

glomerule about 3 on each side, sessile. *Calyx* campanulate, tawny-pubescent and glandular, .1 in. long; lobes 5 subequal, deltoid; calyx in fruit much accrescent, cup-shaped, truncate, .5 in. in diam. *Corolla*-tube funnel-shaped, pubescent and glandular without, sparsely villous within; 2-lipped, upper lip shortly 2-lobed, the lobes rounded, reflexed, lower lip 3-lobed, midlobe long, very villous within. *Stamens* exsert; filaments slightly villous; anther-cells divaricate, often recurved. *Ovary* rounded, villous at tip. *Drupe* globose or obovoid, .75 in. in diam., depressed at apex; pericarp crustaceous; cells 2; seed usually 1.

JOHORE: at Sungee Kaliang, *Ridley* 4031.—DISTRIB. Borneo (at Sandakan, *Governor Creagh*; *Lowe*; at Sarawak, *Beccari* 1111).

4. *VITEX CLARKEANA*, King & Gamble. A small shrubby tree, reaching about 15 ft. in height; branchlets pale brown, round, glabrous or puberulous. *Leaves* coriaceous, 1-foliolate; leaflet sessile, lanceolate or oblong-lanceolate, acuminate at apex, rounded at base; both surfaces glabrous, greyish when dry, the lower punctulate; margins entire, recurved; 6 to 12 in. long, 2 to 3 in. broad; midrib stout, very prominently raised on the lower, slightly on the upper surface; main nerves 12 to 20 pairs, irregularly but slightly curving to near the margin, where they sharply bend parallel to it, all but the few lowest joining in an intramarginal looped nerve; secondary nerves few between the main nerves; reticulations irregular, not transverse and not prominent; petiole .5 to .75 in. long, jointed at the base of the leaflet. *Panicle* terminal, puberulous, 12 to 18 in. long; peduncle stout, angled, 2 to 4 in. long; main branches usually 3, elongate, the middle one usually longest, bearing distant opposite corymbose cymes of rather large flowers; the cymes 1 in. rarely 2 in. long; bracts small, caducous; bracteoles minute; pedicels about .1 to .2 in. long, much thickened in fruit; flowers pale blue, the lip darker. *Calyx*-tube campanulate, tawny-pubescent, .125 to .15 in. long, much enlarged in fruit; lobes 5 irregular, short, acute. *Corolla*-tube .25 in. long, pubescent without and at the insertion of the stamens within, 2-lipped; upper lip shortly 2-lobed, lobes recurved; lower lip 3-lobed, the midlobe twice as long as the recurved sides-lobes, constricted below, spreading above, crenate, villous. *Stamens* exsert; filaments villous at base, thickened; anther-cells elliptic. *Ovary* globose, depressed, tawny-pubescent; style slender, as long as stamens; stigma shortly 2-lobed. *Drupe* ovoid, .3 in. in diam. or longer, tawny-pubescent; seed apparently 1 only. *V. simplicifolia*, Clarke in Hook. f. Fl. Br. Ind. IV. 586 (1885).

DINDINGS: Pangkore Island, *Curtis* 1611. PERAK: *Scortechini* 1383; at Telok Sera, *Ridley* 7990; in forest overlooking Bernam River, *King's Collector* 8788. MALACCA: *Griffith* (K.D.) 6064. JOHORE:

Lake & Kelsall on Sembrong River, 4059.—DISTRIB. Borneo (Motley 1269; Beccari 166; Lobb, Haviland 1580).

The name of this plant has had to be changed, as that of *simplicifolia* was already occupied by *V. simplicifolia*, Oliv. in Trans. Linn. Soc. XXIX. 133, t. 130 (1875), a Central African plant collected by the Speke & Grant Expedition.

5. VITEX CORIACEA, Clarke in Hook. f. Fl. Br. Ind. IV. 586 (1885). A tree, reaching 60 ft. or more in height and 15 to 20 in. in diam.; branches slender with greyish-brown fissured bark; branchlets pale brown, obscurely quadrangular, striate, puberulous. *Leaves* coriaceous, 3-foliolate; leaflets petioluled, entire, lanceolate or oblanceolate, obtuse or acute at apex, long-attenuate at base; both surfaces glabrous, upper shining, lower dull, minutely glandular, prominently reticulate; 3 to 5 in. long, 1 to 2 in. broad, the midlobe only slightly longer than the others; midrib prominent; main nerves 6 to 7 pairs, curving upwards to and along the margin where they anastomose, joined by prominent but irregular netted reticulations all raised on the lower surface; petiole 1 to 2 in. long, puberulous, angular, the apex swollen, petiolule of mid-leaflet about .5 in. long, of the side ones about .25 in. *Panicles* terminal, strict, sessile, minutely fulvous-puberulous, reaching 6 to 8 in. in length and 3 to 4 in. in breadth; branches many, elongate, ascending, subquadrangular; the main peduncles often 3 in. long or more; the flowers in small often distant clusters; bracts small, linear; flowers violet or blue. *Calyx* funnel-shaped, fulvous-pubescent, enlarged and cup-like in fruit; tube .1 in. long; lobes 5, rounded, .05 in. long. *Corolla* 2-lipped; tube fulvous-pubescent without except at the base, as also within at the insertion of the stamens, .25 in. long; upper lip 2-lobed, lobes rounded, very pubescent, ciliate, .1 in. long; lower lip 3-lobed, midlobe ovate crenate, contracted at base, shaggy-villous within, .15 in. long, side lobes rounded, reflexed, .125 in. long. *Stamens* exsert; filaments thickened, pubescent; anthers curved so as nearly to meet at the tips. *Ovary* globose, only slightly glandular; style longer than filaments, pubescent; stigma bifid, the lobes reflexed. *Drupe* ellipsoid, very smooth, .5 in. long, .25 to .35 in. broad, seated on the enlarged cup-shaped calyx; pericarp rather thin. *Seed* apparently 1 only.

KEDAH: lower slopes of Kedah Peak, Ridley 5555. PENANG: Government Hill, Curtis 323. PERAK: on Waterfall Hill, at 1000 ft., Wray 2225; Scortechini 2082; in hill forests, at 500 to 800 ft., King's Collector 4388, 4638, 7782, 8135. MALACCA: Griffith (K.D.) 6065, 1; Maingay (K.D.) 1203; at Ayer Panas and Bukit Bruang, Derry 98, 1029. SINGAPORE: T. Anderson 183.

6. *VITEX SIAMICA*, Williams in Bull. Herb. Boiss. Ser. 2, V. 431 (1905). A tree with spreading branches, reaching 30 to 40 ft. in height and 15 to 20 in. in diam. of stem; branchlets rather slender, dark brown, glabrous, with prominent usually elongated lenticels. *Leaves* coriaceous-chartaceous; 3-foliolate, the leaflets all petiolulate, glabrous, entire; leaflets ovate or ovate-lanceolate, acuminate often bluntly at apex, rounded or cuneate at base, the side leaflets sometimes slightly asymmetric; the middle leaflet 2.5 to 5 in. long, .75 to 1.75 in. broad, the side ones usually about one-third smaller; midrib slender, raised beneath; main nerves 12 to 24 pairs, usually regularly spaced and parallel, only slightly curving to the margin and then anastomosing in an obscure looped marginal nerve, all raised beneath; secondary nerves and reticulations firmly netted; petiole 1 to 2 in. long, slender; petiolules about .5 in. long, the middle one only slightly longer than the others. *Panicles* terminal, with sometimes additional branches from the axils of the upper leaves, minutely puberulous, sessile, many-flowered, reaching sometimes 12 in. in length; rachises very slender, puberulous, obscurely 4-angled; branches at first 3-chotomous, ultimately ending in slender dichasia; bracts many, conspicuous, persistent, linear-lanceolate, .25 to .75 in. long; bracteoles 2 to each pedicel, similar but slightly smaller; pedicels slender, sometimes 0; flowers small, pale blue or white. *Calyx*-tube campanulate, pubescent and with glandular dots without, .05 in. long; teeth 5, acute, .025 in. long; in fruit much enlarged, cup-shaped. *Corolla* small, 2-lipped; tube .1 in. long, pubescent on both sides except at the base, and with many yellow glands; upper lip with 2 short obtuse lobes, lower with 3 obtuse lobes, the middle lobe the longest and villous inside. *Stamens* included or very slightly exsert; filaments thickened, villous; anther-cells ellipsoid, parallel. *Ovary* rounded, depressed, sparsely glandular; style rather thick, as long as stamens; stigma shortly 2-fid. *Drupe* .15 in. in diam., globose, depressed at top, obscurely 4-lobed, glandular, black when dry; pyrene with thin putamen. *Seeds* usually 1 to 2, ovate, acute at base, flattened; testa thin. *V. sympodiophora*, P. Brühl MS. in Herb. Calc. *V. lankavana*, H. H. W. Pearson, MS. in Herb. Penang.

KEDAH: at Coah, Langkawi Island, *Curtis* 1683; at Dayong Bonting, Langkawi, *Fox* 12720. PERAK: on Batu Kurau top, *Scortechini* 1618; in open jungle on the top of limestone hills, at 400 to 1000 ft., *King's Collector* 7034, 8264. SELANGOR: top of rocks, Gua Batu, *Ridley* 8535.

Brühl's description, with drawings, in the Calcutta Herbarium, is most complete, and has been of great use, especially as perfect flowers are very few on the specimens available.

7. *VITEX PUBESCENS*, Vahl Symb. III. 85 (1794). A large tree, reaching a height of 50 to 60 ft. or more; bark ash-coloured, fissured; branchlets quadrangular, brown, lenticellate; innovations tawny-pubescent. *Leaves* chartaceo-coriaceous; digitately 3- to 5-foliolate, the middle leaflet always largest, the two next large, the basal pair when present much smaller; leaflets entire, sessile or subsessile, obovate or elliptic or broadly lanceolate, obtuse or acuminate at apex, rounded or cuneate at base; glabrescent on the upper surface except on the nerves, minutely pubescent on the lower surface; middle leaflet 6 to 8 in. long by about 3 in. broad, rest smaller in gradation; midrib stout; main nerves 12 to 20 pairs, regular, curving gently upwards and connected by prominent nearly parallel transverse nervelets; petiole 2 to 4 in. long, deeply channelled above; petiolules when present under .25 in. long. *Panicles* terminal, densely tawny-pubescent, pyramidal, usually sessile, reaching 10 in. in length and 6 to 8 in. in breadth; rachises sharply quadrangular; branch peduncles often 3 to 4 in. long; bracts many, conspicuous, persistent, ovate or spatulate, those of main nodes sometimes leaf-like; bracteoles similar to the bracts but smaller; pedicels none or very short; flowers blue or lilac. *Calyx* campanulate, thickly tomentose, .15 to .25 in. long; lobes 5 acute. *Corolla* 2-lipped, gibbous; tube broad, pubescent and glandular without except at the base, villous within at the insertion of the stamens, glabrous below it, about .25 in. long; upper lip 2-lobed, lower 3-lobed, the midlobe much the longest, villous within and concave at tip, the others rounded, reflexed. *Stamens* exsert; filaments broad and villous at the base; anther-cells elongate, connected only at tip. *Ovary* glabrous; style slender, longer than stamens; stigma shortly bifid. *Drupe* black, globose, .2 to .3 in. long, depressed at top, faintly ribbed, 4-celled. Schauer in DC. Prodr. XI. 685; Blume Bijdr. 812; Dene. in Nouv. Ann. Mus. d'Hist. Nat. III. 401; Bedd. Fl. Sylv. XXI.; Kurz For. Fl. II. 271; Miq. Fl. Ind. Bat. II. 861; Clarke in Hook. f. Fl. Br. Ind. IV. 585; Koord. & Val. Bijdr. VII. 202; Prain Beng. Plants 833. *V. arborea*, Roxb. Hort. Beng. 46, and Fl. Ind. III. 73; Jack in Mal. Misc. I. 18, and in Hook. Bot. Misc. I. 285; Wall. Cat. 1747; Wight Ic. t. 1465. *V. inaequifolia*, Turcz. in Bull. Soc. Imp. Nat. Mosc. II. 223.

PENANG: *Wallich* 1747 part; *J. Scott*; *Curtis* 64. PERAK: at Thaipeng, *Wray* 139; *King's Collector* 267; *Scortechini* 77, 99, 916. MALACCA: *Griffith*; *Maingay* (K.D.) 1204; *Derry*. SINGAPORE: *Wallick* 1747 part; *Schomburgk* 48; *Cantley* 17; *Ridley*.—DISTRIB. India, Burma, Malay Archipelago.

8. *VITEX HETEROPHYLLA*, Roxb. Hort. Beng. 46 (1814), and Fl. Ind. III. 75 (1832). A large tree, reaching 80 ft. in height and 3 ft. in diam.

of stem; branchlets quadrangular, dark grey, lenticellate, gland-dotted. *Leaves* chartaceous; 5-foliolate, the middle leaflet longest, the next pair not much smaller, the lowest pair sometimes nearly as long, sometimes reduced, all petiolulate or the lowest sometimes sessile; leaflets entire, variable, elliptic or elliptic-oblong or -ovate or -obovate, often long-cuspidate-acuminate at apex, attenuate or somewhat rounded at base, the side leaflets usually unequally; both surfaces glabrous, dark reddish-brown when dry, the upper with white, the lower with yellow glands; middle leaflet 5 to 7 in. long, 3 to 4 in. broad, the rest smaller in proportion; midrib stout, slightly impressed above, raised beneath; main nerves 7 to 10 pairs curving upwards to and along the margin and joined by fairly regular and prominent transverse nervules; petiole 3 to 6 in. long, terete below and flattened above; petiolule of middle leaflet .5 to 1 in. long, of next pair about .5 in., of the lowest pair 0 to .25 in. long. *Panicles* terminal, the lowest nodes often leafy, thinly cinereous-tomentose, usually sessile, thyrsoïd, reaching 12 in. in length and 8 in. in diam.; branches opposite, elongate, quadrangular, bearing interrupted pairs of cymules usually .5 to .75 in. long; bracts 0 or very small; pedicels very short; flowers pale yellow with a blue lip. *Calyx* tubular campanulate, grey-pubescent and glandular, .1 in. long, enlarged and broadened and ribbed in fruit; teeth 5, small, acute. *Corolla*-tube broadly funnel-shaped, pubescent and dotted with yellow glands without, glabrous within except a row of villous hairs within below the insertion of the stamens; 2-lipped, the upper lip of 2 recurved acute lobes .1 in. long, the lower of 3 lobes, the side ones recurved, obtuse, .1 in. long, the middle one oblong, .15 in. long, villous on the throat. *Stamens* exerted, curved; filaments glabrous; anther-cells oblong, at first curved downwards, afterwards divaricate. *Ovary* rounded, glabrous except a few glandular dots; style slender, thickened above; stigma shortly 2-lobed. *Drupe* pyriform, depressed at top, sparsely glandular, blackish-grey and wrinkled when dry; pyrene very hard, ribbed, hollowed at base. *Seeds* oblong, flattened, .2 in. long, .075 in. broad; testa thin, spongy; cotyledons oblong, .1 in. long; radicle .04 in. long. Wall. Pl. As. Rar. 15, t. 226, and Cat. 1745; Schauer in DC. Prodr. XI. 686 *partly*; Clarke in Hook. f. Fl. Br. Ind. IV. 585; Prain Beng. Plants 833.

PERAK: at Tapa, Wray 197; in hill forests up to 1000 ft., King's Collector 6034, 7530, 10063, 10377.—DISTRIB. India (Sikkim, Assam and East Bengal).

9. VITEX SUMATRANA, Miq. Fl. Ind. Bat. Suppl. 567 (1860).

VAR. *urceolata*, King & Gamble. A tree, reaching 40 to 60 ft. in height and 2 ft. in diam. of stem; branchlets quadrangular, channelled

at the sides from raised lines descending from the sides of the petiole, glabrous or very slightly puberulous. *Leaves* chartaceous, 3- to 5-foliate, the middle leaflet longest, the next pair not much smaller, the lowest pair a good deal smaller, all petiolulate or the lowest pair sessile; leaflets entire, obovate or oblong-obovate, shortly suddenly acuminate at apex, rounded often unequally at base; upper surface glabrous, except on the nerves, olivaceous-brown, shining, rough, minutely white-gland-dotted; lower surface glabrous, paler than the upper, with minute yellow glands; middle leaflet 4 to 6 in. long, 2.5 to 3 in. broad, rest gradually smaller but similar; midrib strong, impressed above; main nerves about 10 pairs, irregular, curving upwards to and along the margin and joined by rather irregular transverse nervules; petiole 1.5 to 4 in. long, quadrangular but not winged; petiolule of middle leaflet about 1 in. long, of next pair about .5 in. long, of the lowest pair 0 to .25 in. long. *Panicles* terminal, thinly cinereous-tomentose, thyrsoïd, usually sessile, reaching 8 in. in length and 5 in. in diam.; branches elongate, cylindrical, bearing interrupted whorls of pairs of many-flowered cymules about .5 in. long; branch-peduncles 1 to 2 in. long; bracts linear .1 to .15 in. long, recurved, deciduous; buds large, reaching .25 in. long. *Calyx* tubular-campanulate, .15 in. long, flattened in fruit and enlarged; tube tawny-pubescent and glandular without, glabrous within; teeth short, acute, rounded in fruit. *Corolla*-tube curved, contracted at the throat, .25 in. long, pubescent without except at the base, quite glabrous within; 2-lipped, upper lip of 2 erect crenate lobes .1 in. long, lower of 3 lobes, midlobe broad, crenate, obtuse, .2 in. long, side lobes shorter, reflexed, all pubescent without, glabrous within. *Stamens* curved, exsert; filaments glabrous; anther-cells attached only at one point, curving to nearly erect. *Ovary* conical, with a few glands on its top; style thickened, sigmoid below, glabrous; stigma shortly 2-lobed. *Drupe* globose, depressed, .3 to .5 in. long, shortly apiculate, wrinkled when dry; pyrene very hard. *Seeds* flattened, oblong; testa thin, spongy. *V. urceolata*, Clarke in Hook. f. Fl. Br. Ind. IV. 585 (1885). *V. heterophylla*, Schauer in DC. Prodr. XI. 686 partly. *V. Loureirii*, Herb. Wight; not of Hook. & Arn.

PERAK: in Upper Perak, at 300 ft., *Wray* 3653; *Scortechini* 61; in dense mixed jungle, at 400 to 600 ft., *King's Collector* 10406. MALACCA: *Griffith* (K.D.) 6064; *Maingay* (K.D.) 1205, 1207.

As pointed out by Clarke, this variety differs in the glabrescent foliage, larger flowers and larger drupes. *V. heterophylla*, Roxb., with which Koorders & Valetton would combine *V. urceolata*, has different leaves and inflorescence and a corolla villous within.

10. *VITEX PTEROPODA*, Miq. Fl. Ind. Bat. Suppl. 567 (1862). A tree, reaching 40 to 60 ft. in height and a considerable diameter of stem; branchlets stout, pale brown, obscurely quadrangular. *Leaves* coriaceous; 5- to 7-foliolate, only the lowest pair much smaller than the others; petiole prominently and very broadly winged; leaflets long, lanceolate or oblong-lanceolate or oblanceolate, acuminate at apex, cuneate at base; both surfaces glabrous, minutely dotted and so scabrid to the touch; margins recurved; 4 to 20 in. long, 1 to 2.5 in. broad; midrib stout; main nerves 12 to 16 pairs, prominent on the lower surface, at first somewhat straight and then curving to and along the margin till they meet, joined by prominent transverse nervules and reticulations; petiole 4 to 7 in. long, broadly winged, the wings broadest (1 to 1.5 in. on either side) at a short distance from the base, sometimes narrowed only near the top, sometimes earlier and then curving upwards, often cordate or auricled at both ends; petiolules .5 to 1 in. long, bordered by the decurrent margins of the leaflet blades. *Panicles* terminal or partly axillary to uppermost leaves, subsessile, glabrous, reaching 1 ft. in length and about 8 in. in diam.; rachises slender, angular, striate or channelled; peduncles of all classes, primary secondary and tertiary, long, ending in few sparse few-flowered short cymules scarcely .25 in. long; bracts linear, acuminate, .1 to .15 in. long, persistent; bracteoles under the calyx similar but shorter; pedicels 0 or very short; flowers white with a pink tinge. *Calyx* urceolate, glabrous, .1 in. long; teeth 5, acute. *Corolla*-tube short, .075 to .1 in. long, puberulous without, glabrous or very slightly villous within near the base; lobes short, obtuse. *Stamens* scarcely exert; filaments villous; anther-cells ellipsoid, nearly parallel. *Ovary* globose, much depressed, glabrous; style slender; stigma shortly 2-forked. *Drupe* ovoid-oblong, .75 to 1 in. long, .5 in. in diam., smooth, seated on the spreading, much enlarged calyx; pericarp very thick; seed 1.

PERAK: *Scortechini*; in dense jungle or low ground near Larut, *King's Collector* 5249, 6668.—DISTRIB. Sumatra (*Teysmann*).

It is unfortunate that we could only find, in all the specimens available, one broken and imperfect corolla. The tree is a remarkable one, and is clearly very nearly allied to *V. per-alata*, King, but differs in the long narrow leaflets with scabrid points, the glabrous, usually terminal, sparsely flowered panicles, short corolla-tube and smaller drupes. The broad wings to the petioles are much the same in both. The specimen of *Teysmann's* at Kew consists only of a couple of leaflets about 20 in. long.

11. *VITEX PER-ALATA*, King MS. in Herb. Calc., Kew Bull. 112 (1908). A spreading tree, reaching 80 ft. in height and 2 ft. in diam. of stem; branchlets very thick, angular, striate, dark brown. *Leaves*

coriaceous; 5- to 7-foliolate, only the lowest pair much smaller than the others; petiole prominently and very broadly winged; leaflets elliptic or elliptic-obovate, acute at apex, long-attenuate at base; both surfaces glabrous; margins recurved; middle lobe 6 to 20 in. long, 3 to 6 in. broad, the rest smaller in proportion; midrib stout, impressed above, raised beneath; main nerves 10 to 14 pairs, prominently raised beneath, curving upwards to and along the margin, joined by a conspicuous (on upper surface) network of reticulations; petiole 3 to 6 in. long, the wings broad below and almost cordate, the breadth (the broadest at 1 to 2 in. above the base) reaching 1.5 to 2 in. on either side at widest, curving upwards rather abruptly or gradually to the top, and veined like the leaves; petiolules often 0, when present scarcely reaching .25 in. long. *Panicles* terminal or sometimes axillary to the uppermost leaves, sessile or peduncled, puberulous, reaching 2 ft. in length and about 1 ft. in diam.; rachises angular, channelled; peduncles up to 8 in. long, very stout, somewhat flattened; secondary peduncles of branches in whorls of 4 around the main rachis, up to 5 in. long; flowers in short opposite or alternate many-flowered cymes, about .5 in. long, along the branches; bracts linear-lanceolate, .1 to .2 in. long, persistent; pedicels 0 or very short; flowers light blue with brown markings. *Calyx* pink, shortly urceolate, tawny-pubescent, .1 to .15 in. long; teeth short, acute, in fruit slightly enlarged and recurved. *Corolla*-tube campanulate, .25 in. long, pubescent without, villous within around the point of insertion of the stamens and up to the midlobe of the lower lip; upper lip of 2 ovate acute lobes .1 in. long, the lobes reflexed; lower lip of 3 lobes, side lobes oblong, rounded, .15 in. long, reflexed; midlobe broad, obtuse, .2 in. long, all puberulous. *Stamens* exsert; filaments flattened at base, villous hairy; anther-cells ellipsoid, rather short, slightly divaricate. *Ovary* rounded, depressed, villous at top, glabrous below; style slender, slightly longer than the stamens; stigma shortly 2-forked. *Drupe* ovoid-conoidal, smooth, longitudinally ribbed, 1.5 in. long by 1 to 1.25 in. broad; pericarp very thick; pyrene with rather soft shell. *Seed* 1; testa membranous; cotyledons orbicular, flat.

PERAK: at Simpang, *Wray* 2029, 2254, 2305; in dense jungle on low wet ground near Larút, *King's Collector* 2064, 6187, 6874, 8299.

This must be a splendid tree and worthy of cultivation for ornamental purposes. The large fruit, resembling that of the walnut, and the broad wings to the leaf-petioles are very characteristic.

12. *VITEX GLABRATA*, Br. Prodr. Fl. Nov. Holl. 512 (1810). A large tree; branchlets pale brown, obscurely quadrangular; innovations

fulvous-tomentose. *Leaves* chartaceous; digitately 3- to 5-foliolate, the lowest pair rather smaller than the others, the middle leaflet slightly larger; leaflets entire, petiolulate, obovate elliptic or elliptic-oblancoleate, acuminate at apex often obtusely, attenuate or cuneate at base; both surfaces grey-pubescent when young, afterwards glabrate or with scattered appressed hairs and a few glands beneath, the nerves beneath pubescent and with tufts of hair in the axils; 2 to 6 in. long, 1.5 to 2.5 in. broad; midrib slender, impressed above, raised beneath; main nerves 10 to 20 pairs, regular, slender, the uppermost ones obscure, slightly curved to the margin; transverse nervules and reticulations obscure; petiole 3 to 6 in. long, angular, channelled above; end petiolules .75 to 1 in. long, rest .25 to .5 in. long, angled and channelled. *Cymes* axillary, corymbose, peduncled, puberulous, reaching 4 to 5 in. in length and 2 to 3 in. in diam.; peduncles slender, angular, up to 2 in. long; branches markedly dichotomous, spreading; bracts linear, pubescent, caducous; pedicels slender, 0 to .1 in. long; flowers white, the lip blue-purple. *Calyx* campanulate, .05 to .1 in. long, pubescent without, enlarged in fruit; teeth 5, very short, acute. *Corolla*-tube broadly cylindrical, .2 in. long, pubescent without, glabrous within except a ring of villous hairs at the insertion of the stamens, the hairs extending up the midlobe of the lower lip; upper lip with 2 obtuse recurved lobes .15 in. long; lower lip 3-lobed, the side lobes recurved, .15 in. long, the midlobe spreading, .25 in. long, densely villous. *Stamens* much exsert; filaments villous; anther-cells short, ellipsoid, divaricate. *Ovary* globose, pubescent at top; style slender, as long as stamens; stigma spreading. *Drupe* ovoid or obovoid, succulent, .3 to .5 in. in diam., smooth. Schauer in DC. Prodr. XI. 695; Benth. Fl. Austral. V. 68; Clarke in Hook. f. Fl. Br. Ind. IV. 588; Koord. & Val. Bijdr. VII. 208; Prain Beng. Plants 833. *V. Cunninghami*, Schauer l.c. 691. *V. leucoxydon*, Schauer l.c. 692 in part; Kurz For. Fl. II. 273; Miq. Fl. Ind. Bat. II. 864, not of Linn. f. *V. bombacifolia*, Wall. Cat. 1749; Walp. Rep. IV. 86. *V. pallida*, Wall. Cat. 1751.

KEDAH: in dense jungle near sea-level, *Kunstler* 1763. PENANG: *Curtis* 1071.—DISTRIB. India (Assam to Chittagong), Burma, Java, Siam, Cochin China, North Australia and Queensland.

13. *VITEX LONGISEPALA*, King & Gamble in Kew Bull. 112 (1908). A small or moderate-sized tree; branchlets rather stout, obscurely quadrangular, softly tawny-pubescent as are the innovations. *Leaves* membranous; trifoliolate, the middle leaflet largest and petiolulate, the side ones subsessile; leaflets ovate or elliptic-ovate, abruptly caudate-acuminate at apex, the middle leaflet acuminate or cuneate at base, the

side ones cordate or rounded or acute and unequal; the upper surface sparsely hispid and gland-dotted, the lower tawny-pubescent, villous on the nerves and gland-dotted; margins entire; 4 to 12 in. long, 2 to 6 in. broad; midrib stout; main nerves 8 to 15 pairs, curving upwards to and along the margin and joined by many transverse nervules and reticulations; petiole 2 to 6 in. long, densely tawny-pubescent; petiolule of middle leaflet .25 to 2 in. long, of side leaflets none or under .5 in. long. *Cymes* axillary, opposite, tawny-pubescent, 1 to 2.5 in. long; main peduncles usually 2, vertically arranged, 1 to 1.5 in. long; branches 2- to 3-chotomous, spreading, corymbose; bracts conspicuous, narrowly lanceolate, .25 to .75 in. long, persistent; pedicels about 1 in. long; flowers primrose-yellow. *Calyx* villous, with golden brown hairs; tube campanulate, .1 in. long; lobes 5 subequal, oblong-lanceolate, .25 in. long, conspicuous. *Corolla*-tube slender, funnel-shaped, .4 to .5 in. long, prominently dotted with yellow glands; 2-lipped with a scanty ring of hairs within at the insertion of the stamens, .15 in. above the base of; upper lip shortly 2-lobed, the lobes rounded; lower lip 3-lobed, side lobes reflexed, middle lobe narrowed below, broadened above and fimbriate, twice as long as side lobes. *Stamens* exsert: filaments glabrous, slender; anther-cells elongate, narrow, parallel. *Ovary* conoidal on a cylindric base, the top densely yellow-glandular; style slender; stigma bifid. *Drupe* ovoid, black, smooth, gland-dotted, .3 in. long; pyrene hard, reticulately ridged, with 3 to 4 fertile cells near the top and a large cavity below. *Seeds* obovoid, slightly flattened, .075 in. long; testa thin.

PENANG: at Batu Kawan, *Curtis* 395. PERAK: at Bujong Malacca, *Ridley* 9723; at Tapa, *Wray* 1319; at Waterloo, *Curtis*; *Scortechini* 100, 113, 340; in open jungle, Goping, *King's Collector* 460. SELANGOR: *Ridley* 7595; at Rawang, *Goodenough* 10488.

This species is very near indeed to *V. vestita*, but differs in the much larger leaves and the prominent large bracts and calyx-lobes.

14. *VITEX VESTITA*, Wall. Cat. 1750 (1828). A moderate-sized tree; branchlets rather slender, obscurely quadrangular, softly grey-tawny-pubescent as are innovations. *Leaves* membranous; trifoliate, all three leaflets petioluled, the mid-leaflet much the largest; leaflets elliptic or elliptic-lanceolate, long-acuminate at apex, the middle leaflet equally acuminate at base, the side ones rounded or acute with more or less unequal sides; the upper surface sparsely hispid and gland-dotted, the lower softly tawny-pubescent, villous on the nerves, also yellow-gland-dotted; margins entire; 3 to 7 in. long, 1.5 to 4 in. broad; midrib stout; main nerves 8 to 10 pairs, curving upwards to

and along the margin and joined by prominent rather irregular nervules and reticulations; petiole usually slender, 2 to 3 in. long, petiolule of middle leaflet 1 to 1·5 in. long, of side leaflets ·25 to ·5 in. long. *Cymes* axillary, opposite, sessile, tawny-pubescent, 1 to 1·5 in. long, 2- to 3-chotomous; main peduncles usually 2, sometimes more, one above the other vertically, ·25 to ·5 in. long; branches 2- to 3-chotomous, corymbose, spreading; bracts minute, linear, caducous; pedicels slender, 0 to ·1 in. long; flowers yellow (*Kunstler*). *Calyx* campanulate, densely pubescent and gland-dotted without, ·1 to ·15 in. long, subtruncate or 2-lipped, enlarged and saucer-shaped in fruit; lobes acute, short. *Corolla*-tube slender, 2-lipped, narrow, cylindrical, ·4 to ·5 in. long, glabrate without and with large yellow glands, glabrous within except for a villous ring about ·1 in. above the base and as far below the insertion of the stamens; upper lip shortly 2-lobed, lower 3-lobed, the midlobe slender, hardly longer than the others. *Stamens* included; filaments glabrous; anther-cells elongate, narrow, curved downwards, each ending in an oblong empty appendage about half as long as the cell. *Ovary* densely covered with yellow glands, oblong, obtuse; style slender. *Drupe* oblong, ·3 to ·4 in. long and ·25 in. broad, sparsely gland-dotted; pyrene hard, reticulately ridged, with 3 to 4 fertile cells near the top and a large empty cavity below. *Seeds* obovoid, flattened, acute at base, ·06 in. long; testa thin; cotyledons elliptic, fleshy; radicle small. Schauer in DC. Prodr. XI. 692; Miq. Fl. Ind. Bat. II. 864; Kurz For. Fl. II. 272; Clarke in Hook. f. Fl. Br. Ind. IV. 587. *V. Finlaysoniana*, Wall. Cat. 6314.

PENANG: *Wallich* 1750 B, *G. King*; at Penara Bukit, *Curtis* 265. PERAK: on Maxwell's Hill, *Wray* 699; *Kunstler* 176. SELANGOR: at Bukit Kutu, *Goodenough* 10547. MALACCA: *Griffith* (K.D.) 6063; *Cuming* 2351; *Derry* 656, 899. JOHORE: at Jaffaria, *G. King*. SINGAPORE: at Sungei Jeeroo, *Ridley* 3867; at Chenchukang, *Goodenough* 2792.—DISTRIB. Burma, *Wallich* 1750 A; Sumatra, Borneo.

15. VITEX GAMOSEPALA, Griff. Notul. IV. 178, and Ic. Pl. Asiat. t. 448, fig. 2 (1854). A slender moderate-sized tree; branchlets dark brown, prominently lenticellate, innovations fulvous-hairy. *Leaves* chartaceous; trifoliolate, all three leaflets petiolulate, the mid-leaflet somewhat the largest; leaflets entire, ovate or lanceolate, long-acuminate at apex, the side leaflets acute and slightly unequal at base, the mid-leaflet acuminate; both surfaces glabrate except on the nerves beneath, the lower glandular, brown when dry, the upper olivaceous; 3 to 7 in. long, 1·5 to 2·5 in. broad; midrib stout, raised beneath; main nerves 5 to 7 pairs, curving acutely upwards to and along the margin where they meet, joined by an irregular network of nervules, prominently

raised beneath when dry; petiole slender, terete, 2 to 4 in. long; petiolule of mid-leaflet .75 to 1 in. long, of side leaflets .25 in. long. *Cymes* axillary, sessile, corymbose, sparingly fulvous-hairy, 2-chotomous below, 3-chotomous above, reaching 1.5 in. long or more; bracts short, linear, caducous; pedicels slender, 0 to .1 in. long; flowers pale yellow. *Calyx* 2-lipped; tube ovoid, .1 in. long, densely glandular without as are the lobes; upper lip entire, oblong, .275 in. long; lower lip 2-lobed, .075 in. long, the lobes rounded; in fruit split on one side to the base and enlarged to a beaked shallow cup. *Corolla* funnel-shaped; tube .35 in. long, with a ring of hairs within near the base; upper lip entire or shortly 2-lobed, lower 3-lobed, the middle lobe .125 in. long, 2-fid, the side lobes .06 to .1 in. long; tube and lobes, except the ends of the middle lobe of the lower lip which are usually incurved, all covered with prominent large shining yellow glands. *Stamens* exsert; anthers sparsely pilose near the base; cells elongate, parallel, each with a short empty beak. *Ovary* conical, densely glandular; style slender, glabrous; stigma shortly 2-lobed. *Drupe* obovoid, black, slightly glandular, fleshy, .3 in. long, .25 in. in diam.; pyrene very hard, reticulately ridged, hollow at the base, the 3 to 4 cells near the top bearing seeds. *Seeds* oblong, beaked below, .05 in. long; testa thin; cotyledons fleshy, convex, elliptic; radicle minute. Benth. in Gen. Pl. II. 1154; Clarke in Hook. f. Fl. Br. Ind. IV. 588.

PERAK: at Larút, *Scortechini* 445, 1480; in dense forest near Larút, at 500 to 1000 ft. alt., *Kunstler* (*King's Collector*) 1841. SELANGOR: at Kwala Lumpur and on Pahang road, *Ridley* 8546, 10218, 10479; *Curtis* 2366. MALACCA: at Chin Rhingull, *Griffith* (K.D.) 6065; *Maingay* (K.D.) 1202. SINGAPORE: at Changi, *Ridley* 2788.

As pointed out by Clarke, this species in its inflorescence and corolla, and, it may be added, in its fruit, shows a great affinity to *V. vestita*. But the calyx distinguishes it at once, and the leaves differ a good deal. *Griffith's* fig. represents the anthers only.

VAR. *Scortechinii*, King & Gamble. *Cymes* shorter and few-flowered. *Calyx* much shorter, the upper lip only .075 in. long, the lower .025 in. with more acute lobes. *Corolla* similar, but middle lobe of lower lip entire and yellow glands much fewer and less prominent.

PERAK: *Scortechini*; at Bujong Malacca, *Ridley* 9725; at Tapa Batang Padang, *Wray* 180; at lower camp, Gunong Batu Pateh, 3400 ft., *Wray* 992, 1080. NEGRI SEMBILAN: at Seremban, *Ridley* 10096.—DISTRIB. Sumatra (*Forbes* 3060).

VAR. *Kunstleri*, King & Gamble. *Leaflets* ovate, acuminate at apex and base, 2 to 3 in. long, 1 to 1.5 in. broad; petiole 1 to 2 in. long; petiolule of end leaflet .5 in., of side leaflets .25 in. long. *Calyx* 2-lipped;

short, .1 in. long; upper lip .075 in. long, acute or rounded, often 2-lobed; lower lip acutely 2-lobed, the lobes .05 in. long. *Corolla*-tube slender, .45 in. long, very glandular; upper lip shortly 2-lobed; lower lip 3-lobed, side lobes short, narrow, midlobe longer, obtuse. *Anther*-cells with a short rounded beak. Otherwise as in type.

PERAK: at Ulu Bubong, in open jungle at 400 to 600 ft., *King's Collector* 10605. TRINGGANU: at Bunda, *Rostado* (Herb. *Ridley* 11982).—DISTRIB. Sumatra (*Forbes* 2685).

This is a well-marked variety, but is not quite deserving of specific rank.

Tribe III. CARYOPTERIDEE.

11. PERONEMA, Jack.

A small tree; branchlets grey-tomentose. *Leaves* opposite, imparipinnate; leaflets sub-opposite, in several pairs, entire. *Inflorescence* of large compound, spreading, terminal, trichotomous panicles of corymbose cymes; flowers very small; bracts small, setaceous. *Calyx* campanulate, 5-partite, not accrescent. *Corolla*-tube short; limb 2-lipped, 5-lobed, the midlobe of the lower lip longer than the rest. *Stamens* 2, involute in bud, exert; anthers broadly ovate-reniform with parallel cells. *Ovary* 4-celled, the cells 1-ovuled; style filiform; stigma entire or bifid; ovules attached laterally near the top of the placenta. *Fruit* a small globose capsule of 4 crustaceous valves, the valves separating from the base together with the adjoining portions of the central placenta. *Seeds* attached centrally near their top, pendulous, exalbuminous; testa thin, as are the cotyledons; radicle minute.—DISTRIB. One species, Malayan.

PERONEMA CANESCENS, Jack in Mal. Misc. II. No. 7, 46 (1822). A small tree; bark grey; branchlets stout, grey, obtusely quadrangular; pith quadrangular. *Leaves* chartaceous, reaching 1 to 2 ft. in length; pinnules 7 to 9 pairs, the upper pairs usually opposite, the lower sub-opposite or nearly alternate; the rachis winged, the wings narrow, from .05 to .25 in. broad; petiole 2 to 7 in. long; leaflets sessile, lanceolate, acuminate at apex, cuneate at base, gradually increasing in size upwards, from 1 in. by .5 in. at the base to as much as 9 in. by 2.5 in. at the tip; upper surface glabrous, lower puberulous, tawny-canescens; margins entire or serrate; midrib prominent; main nerves 20 to 30 pairs, regular, straight, joined by loops near the margin; reticulations netted. *Panicle* reaching 12 in. in length and about 20 in. in breadth, tawny-puberulous; peduncle stout; rachis quadrangular; lower branches opposite, long- (4 to 5 in.) peduncled, ending, as the upper ones, in corymbose, many-flowered cymes; bracts scarcely .2 in. long,

bracteoles very small, numerous; pedicels slender, very short; buds globose; flowers white. *Calyx* .1 in. long; lobes acute, glabrous within. *Corolla* glabrous within, pubescent without; lower midlobe .15 in. long, the rest .1 in. *Stamens* deflexed; filaments thickened towards the base. *Ovary* villous, as is the base of the style. *Capsule* densely tawny-pubescent, .125 in. broad, .1 in. long. Hook. Comp. Bot. Mag. I. 152; Wall. Cat. 9075; Schauer in DC. Prodr. XI. 627; Wight Ic. t. 1460; Griff. Notul. IV. 177; Miq. Fl. Ind. Bat. II. 909; Clarke in Hook. f. Fl. Br. Ind. IV. 599; Koord. & Val. Bijdr. VII. 214. *P. heterophyllum*, Miq. Fl. Ind. Bat. Suppl. 570.

PENANG: Racecourse, *Curtis* 2427. PERAK: at Ijuk, *Scortechinii* 1160. MALACCA: *Griffith* (K.D.) 6015. PAHANG: *Ridley* 2247. SINGAPORE: at Bukit Mandai, *Ridley* 3993.—DISTRIB. Sumatra (*Teysmann*, *Forbes* 2655), Java, Borneo (*Motley* 870).

12. PETRÆOVITEX, Oliver.

Shrubs, usually climbing. *Leaves* opposite, simple or 3-foliolate or bipinnate, petiolate. *Inflorescence* of terminal or axillary paniculate cymes with puberulous spreading branches; bracts subulate; flowers very small, shortly pedicellate. *Calyx* short, campanulate, much accrescent after flowering, the tube then long, and the lobes converted into oblanceolate scarious reticulate wings. *Corolla* oblique, 2-lipped; the lobes obtuse, incurved at the tip. *Stamens* 4, subequal or didynamous; exert or included; anthers oblong; cells parallel. *Ovary* obovoid, imperfectly 2-celled, cells 2-ovuled; ovules pendulous; style slender; stigma bifid. *Fruit* capsular, oblong or wedge-shaped; exocarp thin. *Seeds* 2 (or 1 by suppression), attached to the central placenta; testa membranous; albumen none; cotyledons oblong or obovate, emarginate, fleshy; radicle thick, inferior.—DISTRIB. About 3 species, native of the Malay Peninsula and Archipelago.

Tawny-pubescent; leaves 3-foliolate, leaflets under 3 in. long;
capsule prominently ribbed 1. *P. Scortechinii*.
Glabrous or very slightly puberulous; leaves 1 to 3-foliolate,
leaflets over 3 in. long; capsule not ribbed 2. *P. bambusetorum*.

1. PETRÆOVITEX SCORTECHINII, King & Gamble in Kew Bull. 113 (1908). A shrub, perhaps climbing; branchlets pale brown, somewhat angular, puberulous; innovations tawny-pubescent. *Leaves* opposite, membranous, trifoliolate; end leaflet ovate, shortly and obtusely acute at apex, rounded or slightly cuneate at base; 2 to 3 in. long, 1 to 2 in. broad; upper surface minutely pubescent, lower grey-pubescent; margins entire or undulate, main nerves 4 pairs, curving sharply upwards; side

leaflets similar but rather smaller and usually somewhat unequally cordate at base; petiole 1·5 to 2 in. long; petiolule of end leaflet ·5 to ·75 in. long, of side leaflets ·25 in. long, all pubescent. *Cymes* in axillary, tawny-pubescent, 3- or 2-branching panicles up to 6 in. long, the uppermost very short and few-flowered; bracts leafy, nearly orbicular, ·5 to ·75 in. in diam., pale; pedicels short. *Calyx* deeply-cleft, tawny-pubescent; lobes 5 or 4, oblong or spatulate, ·25 in. long; fruiting calyx much enlarged; the tube ·25 in. long, enclosing the fruit; the 5 or 4 lobes expanded into elliptic oblong shining scarious lobes ·75 to 1 in. long, having 3 to 5 longitudinal nerves and prominent netted reticulation. *Corolla* very small (buds only available), 2-lipped; lobes spatulate, concave, ·1 to ·15 in. long. *Stamens* 4 exsert, 2 lower longer than the 2 upper; filaments short; anther-cells of upper pair parallel, of lower slightly divaricate. *Ovary* cylindric, villous, obtuse at top, 2-celled; style short; stigma 2-lobed, the lobes spreading. *Fruit* capsular, oblong or wedge-shaped, obtuse and pubescent at tip, ·2 to ·25 in. long; exocarp chartaceous, striate. *Seeds* 2 (or 1 by suppression); cotyledons obovate, obliquely obtuse, emarginate, ·15 in. long, ·1 in. broad.

PERAK: *Scortechini* 753 (or 1753 ?).

2. *PETRÆOVITEX BAMBUSETORUM*, King & Gamble in Kew Bull. 113 (1908). A creeper reaching 30 to 50 ft. long and 2 to 3 in. in diam. (*King's Collector*); branches smooth, pale brown. *Leaves* opposite, chartaceous, 1- or 3-foliolate; leaflets ovate, acuminate at apex, rounded or slightly cuneate at base; 3 to 4 in. long, 1·5 to 2·5 in. broad; both surfaces glabrous; margins entire; main nerves about 8 pairs, straight to join a looped intramarginal nerve rather far from the edge; reticulations netted, raised, prominent beneath; petiole 1 to 2 in. long; petiolules ·25 to ·5 in. long, slender, the end one slightly the longest. *Cymes* in sessile or peduncled, thyrsoid, axillary, glabrous or puberulous panicles reaching 4 to 5 in. long and about 3 in. broad; rachis angular, very slender as are the branches and pedicels; bracts leafy, lanceolate, long-acuminate; bracteoles minute, setaceous; pedicels very short; buds ovoid. *Calyx* in bud very small, scarcely ·05 in. long, with triangular acute teeth; gradually enlarging later until in fruit it has a tube ·25 to ·35 in. long and strongly ribbed, with oblong-spatulate, membranous, shining lobes ·4 to ·5 in. long and ·1 to ·15 in. broad; the lobes prominently 3-nerved and reticulate. *Corolla* very small (buds only available), 2-lipped, the upper lip slightly 2-lobed, the lower deeply 3-lobed, all very small and glabrous. *Stamens* 4, subequal; filaments stout; anthers oblong with parallel cells. *Ovary* rounded; style short; stigma 2-lobed. *Fruit* capsular, wedge-shaped, slightly convex above, ·3 in. long; exocarp thin pubescent, not ribbed. *Seeds* 2 (or 1

by suppression); testa membranous; cotyledons obovate, truncate and slightly emarginate.

PERAK: in dense bamboo forests, at 500 to 700 ft., near Ula Kerling, King's Collector 8765.—DISTRIB. Borneo (*Haviland* 1913; *Ridley* 9065).

The Perak specimens are rather poor ones, with flowers in bud and very young fruit, and they have 3-foliolate leaves, while the Borneo specimen is unifoliolate and in fruit; so that it is not quite certain that they belong to the same species, but after very careful examination we believe that they do, as the leaflets are identical and so are the nerves of the fruiting calyx.

The genus *Petravortex* was founded by Prof. D. Oliver on *P. Riedelii*, Oliv., in Hook. f. Ic. Pl. V. 15. t. 1420 (1883), a plant sent from the Island of Buru by Mr. Riedel, and remarkable for its bipinnate leaves.

Tribe IV. SYMPHOREMEÆ.

13. SPHENODESME, Jack.

Climbing shrubs. *Leaves* opposite, entire. *Inflorescence* of capitate, 3- or 7-flowered, centrifugal cymes enclosed in an involucre of 6 foliaceous accrescent bracts, the cymes in pairs on the branches of large terminal or axillary, leafy, thyrsoid panicles. *Calyx* ovoid-campanulate, usually enlarging after flowering; lobes of 5 rather short teeth. *Corolla* sub-regular; tube short, cylindrical; lobes 5, rarely 6, subequal, imbricate in bud. *Stamens* 5, inserted in the tube of the corolla below the throat, included or exsert; anthers small, oblong or reniform, the cells parallel or divergent. *Ovary* 2-celled, the cells 2-ovuled; ovules pendulous from the apex of the placentiferous axis; style filiform, short or long; stigma 2-lobed. *Drupe* globose or obovoid, included in the calyx, 1-seeded or rarely 2-seeded; exocarp leathery. *Seed* globose, entirely filling the cavity or its lower part; the placentas included within the cotyledons; testa membranous; cotyledons thick, very fleshy; radicle very small, inferior.—DISTRIB. About 10 species, in India, Malaya and the Malay Archipelago.

Corolla-lobes long, narrow; style very short; anthers included in the corolla-tube (Sect. 1. BRACHYNEMA, Griff.) 1. *S. ferruginea*.

Corolla-lobes ovate or oblong, broad; style long, exsert; anthers exsert (Sect. 2. EUSPHENODESMA, C. B. Clarke):—

Flower-heads 3-flowered, the 6 bracts small in flower, enlarged in fruit; branchlets and leaves glabrous or nearly so 2. *S. triflora*.

Flower-heads 7-flowered, the 6 bracts enlarged both at flowering-time and in fruit:—

Branchlets, leaves and inflorescence rufous-hirsute; calyx very hirsute 3. *S. barbata*.

Branchlets, leaves and inflorescence sparingly pubescent or glabrate; calyx nearly glabrous 4. *S. pentandra*.

1. SPHENODESME FERRUGINEA, Briquet in Engl. & Prantl Pflanzenfam. IV. 3A, 181 (1894). A shrub, probably climbing; branchlets and inflorescence rusty stellate-tomentose; branchlets obscurely quadrangular. *Leaves* chartaceous; ovate or elliptic, acute at apex, cuneate or obtuse at base; sparsely hispid-pubescent on the upper surface, especially on the nerves, softly ferruginous-tomentose on the lower; 3 to 5.5 in. long, 2 to 3.5 in. broad; midrib stout; main nerves 5 to 6 pairs, the lowest pair from close to the base, the next about .2 in. above it, both nearly straight to the margin and then along it, the rest curved to meet in a looped intramarginal nerve; transverse nervules irregular; petiole stout, .25 in. to .5 in. long. *Panicles* axillary or terminal, spreading, leafy, densely covered with tawny-yellow tomentum, the whole forming a thyrus 12 in. or more in length and about as broad; peduncles 2 to 3 in. long, 3- or 5-chotomous, the two lower branchlets short-peduncled with each a pair of capitate heads, the two upper long-peduncled and again branching; heads 7-flowered supported by 6 spathulate bracts .75 in. long and .25 in. broad; buds obovoid; flowers sessile. *Calyx* tubular, densely stellate-tomentose without, whitish-villous within, .25 in. long, 2-lipped, the lips variably lobed, usually the upper 2-lobed rather deeply cleft, the lower very minutely 3-toothed. *Corolla*-tube funnel-shaped, slightly curved, .3 in. long, tomentose without, densely villous within; lobes 5, 6 or 7, .2 in. long, linear or ligulate, twisted. *Stamens* included, inserted low down on the corolla-tube, usually somewhat irregularly but generally in 2 to 3 rows, if 3 rows and 7 stamens the upper row 3, the middle 2, the lower 2, these latter close to the base; filaments slender, glabrous, about .1 in. long; anthers reniform. *Ovary* columnar, glabrous; style extremely short; stigma very shortly bifid. *Fruit* not known. *S. microstylis*, Clarke in Hook. f. Fl. Br. Ind. IV. 600. *Brachynema ferruginea*, Griff. Notul. IV. 176.

SIAMESE STATES: Pungah, abundant! *Curtis* 2963; Tongka, fide *Curtis*.—DISTRIB. Burma (Moulmein & Mergui, *Griffith* (K.D.) 6007, *in part*; Tavoy, *Parish*), Siam (*Murton* 62).

The curious arrangement of the stamens inside the corolla-tube and the very short style are such well-marked characters that it would almost seem advisable to reconstitute the genus *Brachynema*, or else to bring together into one genus of 4 sections *Sphenodesme* with *Symphorema* and *Congea*. We are inclined to consider the latter the best course, but it should be done in discussing a Monograph of the Tribe rather than the few species found in a limited area.

2. SPHENODESME TRIFLORA, Wight Ic. t. 1478 (1850). A climbing (sometimes erect, *Kunstler*) shrub; branchlets dark brown, terete, rough with many small lenticels, a slight ring at the nodes. *Leaves*

chartaceous; lanceolate, bluntly acuminate at apex, cuneate at base; glabrous on both surfaces or the younger ones slightly velutinous; 3 to 5 in. long, 1 to 2 in. broad; midrib prominent beneath; main nerves 5 to 6 pairs, the lowest pair very inconspicuous, close to the margin, the next at about .25 in. from the base and 40° with the midrib, curving up to and along the margin, but not meeting the remaining 3 to 4 which curve at about 50° and meet in intramarginal loops; transverse nervules arched; reticulations netted; petiole .25 to .5 in. long, curved. *Panicles* very long, grey-pubescent, the lower branches leafy with ordinary leaves, the upper ones with gradually smaller leaves becoming bract-like; the branches very long, up to 2 ft., slender, scarcely 1 in. broad, bearing distant opposite pairs of 3-flowered capitate cymules each supported by a pair of reduced leaves and furnished with 6 spathulate bracts usually longer than the flowers and enlarging in fruit; flowers sessile, the corollas dark purple, the calyx and bracts dull red. *Calyx* tubular, 10-nerved, velutinous-pubescent without, densely villous within, .1 to .15 in. long; lobes 5, triangular, short. *Corolla* puberulous; tube cylindric, with a ring of hairs near the mouth within, .25 in. long; lobes 5, subequal, rounded. *Stamens* shortly exsert; filaments slender; anthers reniform, the cells somewhat divergent. *Ovary* pyriform, glabrous; style slender. *Drupe* ovoid or obovoid, sometimes constricted above, included in the enlarged prominently ribbed calyx, and supported by the 6 oblong-spathulate glabrescent enlarged bracts, which reach .5 to .75 in. long and .15 to .3 in. broad, and have 3 prominent nerves joined by transverse nervules; exocarp leathery. *Seed* 1, globose, completely filling the lower part of the cavity of the drupe, the upper part empty; cotyledons .1 in. in diam., including between them the remains of the placenta. Griff. Notul. IV. 182; Miq. Fl. Ind. Bat. II. 910; Clarke in Hook. f. Fl. Br. Ind. IV. 61. *Congea Jackiana*, Wall. Cat. 1735, partly.

PENANG: at Ayer Etam, 1000 ft., Curtis 210. PERAK: at Tapa and Jenah, Wray 683, 1383, 1752; at Gunting Bidai, Ridley 7598; at Salam, Scortechini 1119; in open jungle up to 500 ft., Kunstler (King's Collector) 160, 1098, 1623, 2474. SELANGOR: Semangko Pass, Ridley 12086, 12088. MALACCA: Griffith (K.D.) 6009,1; Maingay (K.D.) 1196; at Sungei Udang, Derry 585. JOHORE: at Bukit Kayara, Ridley 11347. SINGAPORE: Kampar jungles, Deschamps.—DISTRIB. Sumatra (Forbes, 3083).

3. SPHENODESME BARBATA, Schauer in DC. Prodr. XI. 623 (1847). A climbing shrub; branches dark brown, rough, lenticellate; innovations, branchlets and inflorescence patently rufous-hirsute. *Leaves* chartaceous; elliptic or elliptic-oblong or elliptic-lanceolate, suddenly and

obtusely acuminate at apex, also mucronate, acute or somewhat rounded at base; sparsely tawny-villous on both surfaces when young, glabrescent when old except on the nerves; 2 to 4 in. long, 1 to 1.5 in. broad; midrib conspicuous, ending in the mucro; main nerves 5 to 6 pairs, the lowest pair almost from the base, the next a little higher up, the rest more distant, curving to join in an intramarginal nerve; transverse nervules few but prominent; petiole .2 to .3 in. long, twisted. *Panicles* in terminal racemes of heads or in single or few pedunculate axillary pairs of heads; the heads 7-flowered, each with 6 spatulate bracts reaching .75 in. long and .25 in. broad and prominently nerved; peduncles .5 to 1.5 in. long, very slender; flowers sessile, corolla blue. *Calyx* campanulate, .15 to .2 in. long, densely long-rufous-hirsute without; lobes 5, short, triangular, each with often 1 or 2 subsidiary shaggy teeth. *Corolla*-tube cylindric, .1 in. long, glabrous below, villous in a ring at the throat within; lobes subequal, .125 in. long, oblong-spatulate, pubescent without. *Stamens* inserted in the throat of the corolla-tube, exsert; filaments slender, glabrous; anthers oblong, cells parallel. *Ovary* rounded, densely villous; style slender, as long as stamens; stigmatic lobes 2, very short. *Drupe* small, globose or obovoid, included in the enlarged calyx, ferruginous-villous; exocarp crustaceous. *Seed* 1, globose, completely filling the cavity of the drupe; testa very thin; cotyledons thick, .05 to .1 in. in diam. Wight Ic. 1474 (*ferruginea*, R.W. in fig. 7); Miq. Fl. Ind. Bat. II. 910; Clarke in Hook. f. Fl. Br. Ind. IV. 601. *Congea barbata*, Wall. Cat. 1738.

PENANG: *Wallich* 1738; at Tulloh Bahang, *Curtis*; *Phillips*. MALACCA: *Griffith* (K.D.) 6009,2; *Maingay* (K.D.) 1194; *Hervey*.

4. SPHENODESME PENTANDRA, Jack in Mal. Misc. I. 19 (1820), and in Hook. Bot. Misc. I. 285 (1830). A climbing shrub; branchlets obscurely quadrangular, lenticellate, pubescent, dark brown. *Leaves* subcoriaceous; elliptic-oblong, -ovate, or -lanceolate, bluntly acute or acuminate often mucronate at apex, rounded at base; both surfaces glabrous when old, the upper shining, the lower pubescent when young; the nerves beneath generally pubescent; 2 to 7 in. long, 1 to 2.5 in. broad; midrib stout; main nerves 7 to 8 pairs, the lowest very thin and close to the margin, the next a little above, curving to and along the margin almost to the tip, the rest more distant, curving to meet in a prominent looped intramarginal nerve; transverse nervules many, nearly at right angles to the midrib; reticulations netted, prominent; petiole .25 to .5 in. long, pubescent, channelled, curved. *Panicles* axillary and terminal, many-flowered, somewhat puberulous, often racemose, leafy and reaching 6 to 15 in. in length: the capitate heads in opposite pairs on slender .5 to .75 in.

long peduncles; flowers in each head 7, supported by 6 oblong-spathulate, obtuse, nearly glabrous, bracts .75 to 1.25 in. long, .25 to .35 in. broad, and with about 6 prominent nerves and reticulations; flowers blue or purple with a yellowish calyx and pale yellow bracts. *Calyx* campanulate or funnel-shaped, usually prominently 10-ribbed, nearly glabrous, .25 in. long; when young with 5 short lobes and a mucro in the angles between them, when old with 5 prominent acuminate aristate lobes, and 5 aristate teeth in the axils; reticulately nerved in the upper half. *Corolla* tubular, the tube .2 in. long, densely villous within in the upper half, glabrous in the lower; lobes leathery, rounded, .05 to .1 in. long, obscurely in 2 lips, the midlobe of the lower lip recurved, the rest spreading. *Stamens* 5, inserted a little below the mouth of the corolla-tube, long-exserted; filaments slender; anthers oblong, the cells parallel. *Ovary* densely tawny-villous; style very long, slender; stigmatic lobes 2, spreading. *Drupe* the size of a pea, globular (*Roxb.*). *Seed* 1, conform to the drupe; cotyledons unequal. Wight Ic. t. 1475 (*S. Wallichiana*, Schauer in letterpress); Griff. Notul. IV. 181; Clarke in Hook. f. Fl. Br. Ind. IV. 602; Briquet in Engl. & Prantl Nat. Pflanzenfam. IV. 3A, 181, fig. 67 E, F. *S. Wallichiana*, Schauer in DC. Prodr. XI. 622. *S. Jackiana*, Schauer l. c.; Miq. Fl. Ind. Bat. II. 299. *S. acuminata*, Wight Ic. t. 1476 (*S. Jackiana*, Schauer in letterpress). *Roscoea pentandra*, Roxb. Fl. Ind. III. 54. *Congea pentandra* and *Jackiana*, Wall. Cat. 1734, 1735. *C. azurea*, Wall. Cat. 1733, partly. *Symphorema Jackianum*, Kurz For. Fl. II. 255.

JUNKSEYLON or TONGKA: *Curtis*. KEDAH: Coah on Langkawi Island, *Curtis* 2522; *Ridley* 8320. PENANG: *Wallich* 1735,1; *Curtis* 269. PROVINCE WELLESLEY: at Krian, *Ridley* 9391. PERAK: *Scortechini* 519; *King's Collector (Kunstler)* 3100, 4532, 7691, 10642. MALACCA: *Griffith*; *Maingay* (K.D.) 1195; *Cunning* 2388; *Derry* 40. PAHANG: *Ridley* 2160. JOHORE: at Bukit Songa, *Ridley* 11122.—DISTRIB. India (Assam, Khasia Hills, Burma), Borneo.

14. CONGEEA, Roxb.

Large climbing shrubs, usually tomentose with mixed simple and stellate hairs. *Leaves* opposite, entire. *Inflorescence* of pedunculate, capitate, 3- to 9-flowered, involucrate cymes in large terminal panicles; the bracts at the base of the peduncles leaf-like, often white or coloured; the involucre of 3 or 4 elliptic or oblong or spatulate bracts connate at the base. *Calyx* tubular, funnel-shaped, slightly accrescent, 5-toothed. *Corolla*-tube slender, widening upwards, glabrate without,

usually villous within, 2-lipped; the upper lip of 2 lobes, the lower of 3, those of the upper lip the largest. *Stamens* 4 didynamous, inserted in the throat of the corolla, exsert; anthers oblong, the cells parallel. *Ovary* imperfectly 2-celled, 4-ovuled; ovules pendulous from the apex of the central placenta; style filiform, shortly bifid. *Drupe* small, obovoid, nearly dry, 1-seeded. *Seeds* conform to the drupe; testa membranous; cotyledons fleshy, unequal, enclosing the remains of part of the placenta; radicle very small, inferior.—**DISTRIB.** Four species, of Burma and Malaya.

Clarke in Fl. Br. Ind. says the drupes are 4-seeded, but every specimen we have examined affords one seed only, accompanied by the remains of the placenta and of 3 abortive ovules.

Involucral bracts reaching 1·5 in. by ·75 in., white-tomentose ; leaves beneath and inflorescence more or less ferruginous-villous, and with about 5 to 6 pairs of main nerves	.. .. .	1. <i>C. vestita</i> .
Involucral bracts reaching 1·25 in. by ·3 to ·4 in., pale lilac, tomentose; leaves beneath and inflorescence softly tomentose and with about 4 pairs of main nerves	.. .. .	2. <i>C. tomentosa</i> .

1. *CONGEEA VESTITA*, Griff. Notul. IV. 174 and Ic. Pl. Asiat. t. 458, fig. 21 (1854). A large climbing shrub; branchlets patently fulvous-hirsute, striate. *Leaves* submembranous; ovate or elliptic, sharply acute at apex, obtuse or shortly cordate at base; upper surface scabrous-pubescent, ferruginous-villous on the nerves, lower villous and grey-tomentose; 3 to 7 in. long, 1·5 to 3 in. broad; midrib slightly impressed above; main nerves about 5 to 6 pairs, curving upwards to and along the margin; transverse nervules many, but, like the reticulations, obscure; petiole ·25 to ·5 in. long, with long tawny hispid hairs. *Panicles* very large; bracts leaf-like, whitened; involucral bracts 4, very slightly connate at base, elliptic-obovate, often bifid at apex, reaching 1·5 in. long by ·75 in. broad, densely white-tomentose, with prominent reticulations and 3 pairs of main nerves; flowers rose-coloured. *Calyx* funnel-shaped, ribbed, ·25 to ·35 in. long, densely white-villous without and within; teeth 5, triangular, acuminate. *Corolla*-tube slender below, gradually widening upwards, ·3 to ·35 in. long, glabrous without, also within except a thick villous ring below the throat; upper lip of 2 ovate-oblong erect or recurved lobes, lower of 3 lobes half as long as the upper, the side lobes erect, the third lobe decurved, all thin, glabrous, with brown nervules. *Ovary* oblong-obovoid, glabrous except a few glands at the tip. *Drupe* nearly dry, obovoid. Clarke in Hook. f. Fl. Br. Ind. IV. 603.

PROVINCE WELLESLEY: Arakuda woods, *Ridley* 6993.—DISTRIB. Tenasserim.

2. *CONGEA TOMENTOSA*, Roxb. Cor. Pl. III. 90. t. 293 (1819). A large climbing shrub; branchlets densely tawny-tomentose. *Leaves* coriaceous; ovate, acute at apex, rounded at base; upper surface glabrous except on the nerves, lower tawny-tomentose; 2 to 4 in. long, 1 to 2.5 in. broad; midrib stout; main nerves about 4 pairs, curving upwards, joined by many regular transverse nervules; petiole tawny-tomentose, .25 in. long. *Panicles* terminal, reaching about 6 in. long and 9 in. broad, 3-chotomous, densely tawny-tomentose; branches long-(2 to 2.5 in.) peduncled, racemose, bearing pairs of heads on .5 in. long peduncles; bracts leaf-like, caducous; involucre bracts 4 to each head, pale lilac, ovate or spatulate, slightly emarginate, densely tomentose, .75 to 1.25 in. long, .3 to .4 in. broad, with 4 to 5 pairs of main nerves. *Calyx* funnel-shaped, densely villous especially within, .25 in. long; teeth 5, .05 to .1 in. long, triangular. *Corolla*-tube slender, slightly longer than calyx, glabrous except a ring of villous hairs at the throat within; 2-lipped, the upper lip long deeply bifid, the lower of 3 short lobes, the midlobe the longest. *Stamens* long-exsert. *Ovary* obovoid, pyriform, glandular at tip; style very slender; stigmatic lobes 2. *Drupe* obovoid, nearly dry; exocarp crustaceous, smooth. *Seed* 1, nearly filling the cavity of the drupe, with 3 abortive ovules; testa very thin; cotyledons thick, unequal, somewhat emarginate. *Wight* Ic. t. 1479, 2 or 1565; *Schauer* in DC. Prodr. XI. 623; *Kurz* For. Fl. II. 256; *Miq.* Fl. Ind. Bat. II. 911; *Clarke* in Hook. f. Fl. Br. Ind. IV. 603. *Roscoea tomentosa*, Roxb. Fl. Ind. III. 57. *Calochlamys capitata*, Presl Bot. Bemerk. 149.

SOUTH-WEST SIAM: at Poongah, *Curtis* 2903, 2962.—DISTRIB. India (Chittagong), Burma, Siam. Often cultivated.

The involucre bracts of our specimens do not agree very well with those figured in the 'Coromandel Plants,' but they agree better with the authentic specimens. We have not been able to make quite sure whether our specimens belong to type *tomentosa* or to the var. *azurea* (*C. azurea*, Wall. Cat. 1733), but we think to the latter.

The following species seems worthy of description here, as possibly also occurring in the Peninsula.

CONGEA FORBESII, King & Gamble in Kew Bull. 114 (1908). A large climber, spreading over great forest trees; branchlets rather slender, hoary-pubescent. *Leaves* chartaceous; oblong or oblong-lanceolate, shortly acuminate at apex, rounded and slightly cordate at base; upper surface shining, glabrous except the puberulous nerves; lower surface softly pubescent, reddish-brown when dry; 3 to 5 in. long, 1 to 1.5 in. broad; midrib strong, impressed above, as are the 5 to 6 pairs of main nerves which start at about 30° with the midrib and curve upwards to and along the margin; transverse nervules many, horizontal; reticulations netted; petiole .2 in. long, tawny-pubescent. *Panicles* terminal, tawny-pubescent, racemose, reaching about 12 in. in

length and 6 in. in breadth; main branches usually 1 pair only, with slender 1 to 1·5 in. peduncles; heads in pairs on short (·2 to ·3 in. long) peduncles, the pairs 1 to 2 in. apart along the raceme; bracts leafy, coloured; involucre bracts 4, grey-tomentose, oblong-spathulate, 1 to 1·5 in. long, ·4 in. broad, within them a pair of linear-setaceous bracteoles about ·3 in. long; flowers light purple. *Calyx* tubular, funnel-shaped, densely villous on both sides but especially within, ·3 in. long; teeth triangular, ·075 in. long, acute. *Corolla-tube* cylindric, slender, ·3 in. long, glabrous except the ring of villous hairs at the mouth within; 2-lipped, the upper lip of 2 lobes longer than the 3 lobes of the lower, margins of the lobes crenulate. *Ovary* obovoid, glabrous except a few glandular dots at top; style very slender. *Drupe* obovoid, dry; exocarp crustaceous, smooth, tipped with the persistent base of the style. *Seed* 1, with the remains of the placenta and 3 abortive ovules; testa extremely thin, membranous; cotyledons unequal, one concave, the other convex, fleshy, ·125 in. in diam., the apex depressed; radicle very small.

SUMATRA: in deep forest. Lampongs, Forbes 1567.

Tribe V. AVICENNIEÆ.

15. AVICENNIA, Linn.

Shrubs or small trees with long creeping roots which give out at intervals narrow, conical, leafless suckers. *Leaves* coriaceous, opposite, entire. *Flowers* small, sessile, in capitate pedunculate heads of close centripetal cymes which are in pairs in the upper axils or in short terminal trichotomous thyrsi or corymbs; bracts small, shorter than the calyx. *Calyx* short, 5-partite, unaltered in fruit; segments ovate, concave, deeply imbricate. *Corolla-tube* short, cylindric; lobes 4, subequal or the posterior lobe slightly the largest. *Stamens* 4, inserted on the corolla-throat; filaments short; anthers shortly exsert; cells ellipsoid, parallel. *Ovary* imperfectly 4-celled by a 4-winged central axis; ovules 4, pendulous between the axial wings; style tapering; stigma bifid. *Fruit* a compressed capsule, dehiscent by 2 leathery valves. *Seed* solitary, erect; embryo imperfectly covered by the 2 integuments; albumen none; cotyledons large, longitudinally plicate; the radicle inferior, thick, villous, the plumule conspicuous, developing before the seed falls.—DISTRIB. Muddy estuaries and sea-coasts of the warmer regions of the globe; species 4 or 5.

Leaves obtuse at apex; capsule over 1 in. long; corolla-tube distinct; stamens exsert; style long 1. *A. officinalis*.
 Leaves acute or acuminate at apex; capsule under 1 in. long; corolla-tube almost none; stamens included; style very short 2. *A. alba*.

1. AVICENNIA OFFICINALIS, Linn. Sp. Pl. 110 (1753). A small tree with greyish-brown thin bark and many blind root-suckers; branchlets pale brown, subquadrangular, glabrous when old; young ones, young leaves and inflorescence with very close pale tomentum. *Leaves* coriaceous; elliptic-oblong or obovate, obtuse at apex, attenuate at base; upper

surface glabrous, smooth and shining, lower surface pale and with a hard, very thin, grey or tawny tomentum, at length glabrate; 2 to 4 in. long, 1 to 2 in. broad; midrib stout, very prominent; main nerves 6 to 8 pairs, at first straight, then curving to anastomose near the margin; reticulations netted; petiole stout, .25 to .75 in. long. *Flowers* sessile, in small heads on rigid angular peduncles either 2 together in upper axils or several in short terminal thyrsi; bract and 2 bracteoles concave, thick, shorter than the sepals; flowers in each head 3 to 6; corolla orange-yellow. *Calyx*-segments thick, .1 to .3 in. long, ovate or suborbicular, scarious-ciliate on the margins, the lower part of the back pubescent, the rest glabrous. *Corolla*-tube very short, cylindrical; lobes 4, ovate, acute or rounded at lip, subequal, .2 in. long, pubescent without, nearly glabrous within. *Stamens* exserted; filaments .1 in. long; anthers .05 in. long; cells parallel, ellipsoid. *Ovary* conoidal, tapering into the style, together .25 in. long; stigmatic lobes curved. *Capsules* 1 to 1.5 in. long, ovoid, compressed, beaked, green with greyish tomentum. *Seed* 1, completely filling the capsule. Schauer in DC. Prodr. XI. 700; Bedd. For. Man. in Fl. Sylv. CLXXIV., and Anal. Gen. t. 22, fig. 2; Brandis For. Fl. 371; Trimen Fl. Ceyl. III. 363; Clarke in Hook. f. Fl. Br. Ind. IV. 604; Miq. Fl. Ind. Bat. II. 912; Koord. & Val. Bijdr. VII. 217; Cooke Bomb. Fl. II. 435; Prain Beng. Plants 838. *A. resinifera*, Forsk.; Dene. in Nouv. Ann. Mus. III. 402. *A. tomentosa*, Br. Prodr. Flor. Nov. Holl. I. 518; Roxb. Fl. Ind. III. 88; Wall. Pl. As. Rar. III. 44, t. 271; Wight Ic. t. 1481; Blume Bijdr. 821; Griff. Notul. IV. 185; Kurz For. Fl. II. 276. *Halodendron Thouarsii*, Roem. & Sch. Syst. III. 485. "*Mangium album*," Rumph. Herb. Amb. III. t. 76. "*Oepata*," Rheede Hort. Mal. IV. t. 45.

PENANG: Wallich 1742; Curtis 3533. MALACCA: Griffith (K.D.) 6069; Maingay (K.D.) 1208. SINGAPORE: T. Anderson 79; River valley road, Ridley 10370; Hullett 163.—DISTRIB. Coasts of India, Ceylon, Burma, Java, eastwards to the Pacific: in tidal creeks and on muddy coasts.

2. *AVICENNIA ALBA*, Blume Bijdr. 821 (1826). A shrub or small tree; branchlets pale brown, shining, obscurely quadrangular; innovations and inflorescence shortly appressed, whitish- or tawny-tomentose. *Leaves* coriaceous; lanceolate, acute or acuminate at apex, attenuate at base; glabrous on both surfaces or whitish-tomentose beneath (especially when young); 2 to 5 in. long, .75 to 2 in. broad; midrib prominent; main nerves 8 to 10 pairs, curving upwards to anastomose near the margin; secondary nerves few, meeting few arched transverse nervules, all somewhat raised on the upper surface; petiole thick, .25 to .5 in. long. *Flowers* sessile, either in small capitate heads or in distichous spikes in short terminal or axillary panicles; rachises and peduncles

angular; bract and 2 bracteoles concave, thick, shorter than the sepals, the bract orbicular, ciliate, the bracteoles ovate, ciliate, acute. *Calyx*-segments thick, .1 in. long, ciliate, slightly pubescent on the back near the base, above glabrous and rugose. *Corolla*-tube very short, sometimes almost none; lobes 4, ovate, concave, acute at tip, the posterior one sometimes bifid, .1 in. long, glabrous. *Stamens* included; filament .03 in. long; anthers .02 in. long, oblong; cells parallel. *Ovary* columnar, with very short conical villous style, together .05 to .1 in. long; stigmatic lobes 2, erect, thick, minute. *Capsules* .5 to .75 in. long, obpyriform, gibbous on one side, acute or acuminate; pericarp green (*Kunstler*) with greyish tomentum. *Seed* 1, completely filling the lower part of the capsule. Wight Ic. t. 1482; Miq. Fl. Ind. Bat. II. 913; Cooke Bomb. Fl. II. 436; Koord. & Val. Bijdr. VII. 221; Prain Beng. Plants 838. *A. officinalis*, Linn., var. *alba*, Clarke in Hook. f. Fl. Br. Ind. IV. 604. *A. resinifera*, Griff. Notul. IV. 186, and in Trans. Linn. Soc. XX. 6, fig. 1. *A. intermedia*, Griff. l. c. *A. officinalis*, Kurz For. Fl. II. 275.

PROVINCE WELLESLEY: in mangrove swamps, *Curtis*. DINDINGS: Pangkore, *Scortechini* 963. MALACCA: *Griffith* (K.D.) 6070, 6071; *Maingay* (K.D.) 1209. SINGAPORE: *Kunstler* (*King's Collector*) 1152. —DISTRIB. India, Burma, Java, Borneo, Celebes, to North Australia, in tidal creeks.

Koorders & Valetton draw attention to the capitate heads shown in Wight's drawing, and refuse to quote t. 1482. We have seen Koorders' Nos. 9696 and 22009 from Java, which have the heads spicate, as do *Kunstler*'s specimens No. 1152. *Haviland*'s Borneo specimens are partly spicate, partly capitate; *Scortechini*'s Pangkore specimens are capitate. But in all the structure of the flowers is the same and agrees with that given in Wight's drawing, so there seems no room for even a variety.

ADDENDA-CORRIGENDA.

VOL. LXXII. II. PART No. 14 (1903).

- Page 113, line 21, for "inner" read "upper"
 P. 114, l. 7, for "ovate" read "obovate"
 P. 117, omit the whole of lines 7, 8 and 9.
 P. 152, l. 4 from below, for "PERAKENSIS" read "PERAKENSE"
 Pages 187, 188, omit the whole of 19, TRISCIADIA, Hook. fil.

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- P. 51, l. 23, after "Wallich." insert "PERAK: Wray 2104, 3271; Scortechini; Ridley 8374; King's Collector 5508, 6431, 6545.—DISTRIB. Andaman Islands; Sumatra; Java, Forbes 2504."
 P. 51, l. 11 from below, before "flowers" insert "greenish-white"
 P. 52, l. 25, after "Flowers" insert "white, sweet-scented,"
 P. 57, at top of page, insert "34. KNOXIA, Linn."
 „ „ l. 3 from below, before "CANTHIUM" insert "35."
 P. 59, l. 11 from below, for "Fruit when ripe . . . glabrous." read "Fruit oblong, obovoid, 1 in. long, yellow, pulpy, acid in taste."
 P. 60, l. 20, for "Fruit unknown." read "Fruit black when ripe."
 „ „ l. 5 from below, after "Fruit" insert "orange,"
 P. 62, l. 20, for "my" read "our"
 P. 64, l. 12, after "Flowers" insert "rosy-white, nearly 1 in. in diam.,"
 P. 66, l. 2, after "bracteolate" insert "; flowers green."
 P. 67, l. 13, after "Flowers" insert "white,"
 „ „ l. 7 from below, after "calyx;" insert "flowers white."
 P. 68, l. 16, after "pubescent" insert "; flowers white."
 „ „ l. 2 from below, after "bracteoles" insert "; flowers white."
 P. 69, l. 18, after "base" insert "; flowers white."
 „ „ l. 4 from below, after "bracteolate" insert "; flowers white."
 P. 70, l. 15, after "linear" insert "; flowers white."
 P. 73, l. 3, after "bract" insert "; flowers white."
 „ „ l. 9 from below, after "Flowers" insert "red,"
 P. 74, l. 22, after "long" insert "; flowers white."
 P. 75, l. 3, after "persistent" insert "; flowers white."
 „ „ l. 5 from below, after "tube" insert "; flowers scarlet."

P. 78, l. 8, *before* "smaller" *insert* "white and"

P. 79, l. 6, *after* "shorter" *add* :—

"Mr. Ridley says this variety is *I. stenophylla*, Ridl. in Trans. Linn. Soc. Ser. 2, iii. 311 (1893), at any rate so far as the Pahang plant is concerned; he considers it a good species."

P. 79, l. 5 from below, *after* "minute" *insert* " ; flowers orange."

P. 80, l. 5, *for* "SCORTECHINI" *read* "SCORTECHINI."

„ „ l. 15, *after* "puberulous" *insert* " ; flowers red."

„ „ l. 12 from below, *after* "minute" *insert* " ; flowers red, orange or yellow."

P. 81, l. 24, *after* "minute" *insert* " ; flowers orange red."

P. 88, l. 7 from below, *after* "common" *insert* " , a sea-shore plant."

P. 89, l. 3 from below, *after* "flowers" *insert* "violet,"

P. 91, l. 8, *after* "long" *add* :—

"Mr. Ridley thinks it is a new species of *Timonius*."

P. 94, l. 9, *after* "Flowers" *insert* "pink,"

„ „ l. 5 from below, *after* "Flowers" *insert* "white,"

P. 95, l. 8, *omit* "*S. longicaulis*, Br. in Wall. Cat. 826."

„ „ l. 20, *after* "Flowers" *insert* "white,"

P. 102, *after* line 12 *add* as note :—

"Mr. Ridley remarks the occurrence of *Myrmecodia echinata*, Gaudich., which is not rare near the sea—PAHANG: Ridley 1462. SINGAPORE: Ridley 5869, 8067."

P. 105, l. 21, *after* "pedicels" *insert* " , white, bracts purple."

P. 106, l. 7, *after* "long" *insert* "ochre-yellow, honey-scented." and at line 11 *after* "Fruit" *insert* "bright light blue,"

P. 111, l. 20, *for* "lucidus." *read* "Lowianus."

P. 132, l. 3 from below, *for* "LUCIDUS" *read* "LOWIANUS"

P. 134, l. 15, *for* "BC." *read* "Blume"

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P. 4, l. 8, *for* "Scandent" *read* "Erect"

P. 5, l. 12 from below, *after* "Fruit" *insert* "white, fleshy,"

P. 6, l. 5, *after* "Fruit" *insert* "white,"

P. 8, l. 23, *for* "climber" *insert* "plant, creeping on tree stems, often"

„ „ l. 6 from below, *after* "Fruit" *insert* "white, showy,"

P. 37, l. 20, *after* "obtuse" *insert* " ; flowers lavender-coloured."

P. 39, l. 2, *after* "24" *insert* " ; Hook. f. Fl. Br. Ind. III. 336 ; " ; line 3, *for* "*Cacalia*" *read* "*Cacalia*" ; and line 4 *for* "E." *read* "C."

P. 48, at the end of Order LXI. COMPOSITÆ, add:—

“Since the description of this Family was written, the following species have been noticed as additions to the Flora:

Tribe VERNONIÆ.

Sparganophorus Vaillantii, Gaertn. Fruct. II. 396 t. 165. A roadside weed, introduced from the West Indies, common in Singapore.—*Ridley, Deschamps.*

Vernonia elæagnifolia, DC. Prodr. V. 22. At Pekan, Pahang, fide *Ridley.*

Tribe ASTEROIDEÆ.

Erigeron linifolius, Willd. Sp. Pl. III. 1955. An escape or garden weed, common.—Penang, *Curtis* 3389, 3401.

Grangea maderaspatana, Poir.; DC. Prodr. V. 373. Kedah, *Curtis* 3809.

Tribe INULOIDEÆ.

Blumea myriocephala, DC. Prodr. V. 445. Selangor, *Curtis*, 2350.

Cæsulia axillaris, Roxb. Hort. Beng. 62, fide *Ridley.*

Tribe HELIANTHOIDEÆ.

Enhydra fluctuans, Lour. Fl. Cochinch. 511. Penang, *Curtis* 3455.

Acanthospermum xanthioides, DC. Prodr. V. 521. An introduced weed in Singapore, fide *Ridley.*”

P. 49, line 13, after “Flowers” insert “bright mauve,”

P. 53, l. 10, for “purple” read “pale blue”

P. 54, l. 24, for “adnatus” read “adnatum”

P. 55, l. 5 from below, omit “SINGAPORE; *Lobb.*”

“ , , lines 4 to 2 from below, omit “*Ridley* (Trans. Linn. Soc., &c. . . . common.”

P. 56, l. 14 from below, for “Salian” read “Tahan”

“ , , l. 4 from below, for “marcescent” read “accrescent”

P. 58, l. 19, at beginning insert “PROVINCE WELLESLEY: common.”

P. 61, l. 23, for “microphylla” read “microphyllum”

P. 64, l. 13 from below, for “white” read “pink”

P. 66, l. 11, after “shrub” insert “or small tree or an epiphyte on lofty trees”

P. 66, l. 14, after “paler” insert “often bright red when fresh”

“ , , l. 22, after “Corolla” insert “pink or white,”

P. 67, l. 29, after “long” insert “, pink, fragrant,”

“ , , l. 7 from below, after “Fruit” insert “black, edible,”

P. 72, at the end of *DIPLYCOSIA* add note:—

“*D. lancifolia*, Ridley in Journ. Str. Br. R. As. Soc. No. 39, 15 (1903) from Gunong Benom in Pahang, has been omitted.”

P. 91, at end of GENTIANACEÆ add note:—

“Ridley says that *Exacum tetragonum*, *Exacum pedunculatum* and *Causcora diffusa*, only admitted on the authority of Lobb's specimens which are of very doubtful locality, ought probably to be excluded. He would add *Limnanthemum cristatum*, Griseb. found at Singapore and at Batu Pahat river, Johore.”

PART No. 17 (1905).

Page 123, line 5, after “*Berry*” insert “white,”

P. 131, last line, after “1808” insert “SINGAPORE: Changchukang, Ridley 3653, 3844 (*fide* Ridley).”

P. 171, line 28 after “101;” insert “Regensb. Fl. 578 (1855); Walp. Ann. V. 475. *Ceratophorus Leerii*,”; and line 31, for “King's Collector” read “Wray”

P. 175, l. 26, for “(?)” insert “about 20 feet high”; and last line, before “Ridley” insert “in the Bukit Kutu woods,”

P. 191, l. 10, after “60” insert “to 80”; and for “10 to 15 in.” read “3 to 4 feet.”

P. 193, ll. 18, 19, for:—

“It has is” read “old trees of any size have become scarce in a wild state, seedlings being still plentiful, but it is”

P. 196, l. 8, for “(?)” read “reaching 50 to 60 feet in height” and line 29, add:—

“The timber is heavy and is used in house-building (*Ridley*).”

P. 237, l. 1, after “144” insert “; Brand Monog. Sympl. 40.”

P. 254, l. 21, for “7348” read “7848.”

P. 257, last line but two add:—“Remarkable among Jasmines for having white instead of black fruit (*Ridley*).”

P. 272, l. 14, to note add:—

“Ridley says this is *Linociera lancifolia*, Ridley in Journ. Str. Br. R. As. Soc. No. 39, 14 (1903).”

PART No. 18 (1905).

Page 280, line 14, after “sessile” insert “, white,”

P. 284, after line 12, insert note:—

“Ridley says that he found *Ehretia burxifolia*, Roxb. Cor. Pl. I. 42, t. 57 along the Rumpin River in Pahang. We have seen no specimens.”

Page 292, line 19, after "Flowers" insert "white,

P. 295, l. 4, after "Wray 2580!" put ";" instead of "." and for "MALACCA: Bujong" read "Bujong Malacca,"

P. 335, l. 13, add:—"Common on the sea-shore (Ridley)" and to the note after "species." add:—

"Ridley writes that *Solanum mammosum*, Linn. Sp. Pl. 187 should be added as it is thoroughly established and a conspicuous feature of the scenery on waste ground in Selangor and Perak. It is also common in old tin mines. No specimens have been seen."

P. 339, l. 9, for "C." read "P."

P. 340, l. 15, to note add:—

"Ridley says the purple-flowered variety is by far the commonest, but is not wild and is found on waste ground only."

P. 340, last line but 2, for "all" read "some of" and after "provinces" insert "sparingly,"

P. 348, l. 20, delete "*Herpestris pygmaea*, Griff. Notul. IV. 104."

P. 348, l. 25, after "Flowers" insert "violet with white throat,"

P. 350, l. 8, for "SESSIFLORA," read "SESSILIFLORA,"

P. 352, l. 4 from below, omit "white or white and pink" and after "exserted" add "; tube and back of upper lip cherry red, lower lip white with a yellow central spot, stigmas yellow (Ridley)."

P. 354, l. 3, for "ASIATICA, Linn. Sp. Pl. 619" read "ATROPURPUREA Ridley n. sp."

P. 354, lines 12 to 17, omit all the references.

P. ,, ,, 19, 20, omit "DISTRIB. &c. to end."

P. ,, line 21, for "BENTHAMIANA 226" read "CÆLESTIS, Ridley, n. sp."

P. 354, lines 29 to 31, omit all the references.

P. ,, line 22, omit "DISTRIB. &c."

P. 355, at the end of the genus *TORENIA* add note:—

"Ridley says that *T. Benthamiana*, Hance, is often cultivated but is not established. He also says that *T. mucronulata*, Benth. in DC. Prodr. X. 409 should be added with the following localities. PENANG: Waterfall and Government Hill, Curtis, 1837. TRENGGANU: Bundi, Rostado. DINDINGS: Gunong Tungul, Ridley 9444. PAHANG: at Tahan River, Ridley. SINGAPORE: Garden jungle, Bukit Timah, Ridley 6894."

P. 357, l. 8, after "Corolla" insert "light blue,"

PART No. 19 (1907).

Page 399, lines 23, 24, for:—

"But the author gives no explanation of his drawings," insert "and the author uses the term 'funiculus umbilicalis.'"

P. 469, line 16, at the end change “.” to “;” and in line 17 omit “*S. caudatus*,”

P. 470, l. 15, for “193.” read “192.”

P. 532, l. 7 from below, for “SELANGORICA, King & Gamble, n. sp.” substitute “CARNOSUM, Merrill & Rolfe in Philipp. Journ. Sc. III. (1908) 121.”

P. 533, l. 9, after “all” add “*Oxystelma carnosum*, R. Br. Prodr. Fl. Nov. Holl. 462; Dene. in DC. Prodr. VIII. 543. *Cynanchum carnosum*, Schltr. in Perkins Fragm. Fl. Philipp. 120, *Vincetoxicum carnosum*, Benth. Fl. Austral. IV (1869) 331.”

Page 533, l. 11 at end, add “Australia.”

P. 543, l. 17, for “Patch” read “Pateh”

P. 546, l. 12, for “Hort. Ham.” read “Herb. Buch.-Ham.”

P. „ „ 4 from below, for “Tjuk” read “Ijuk”

P. 549, at end of PERGULARIA insert note:—

“According to N. E. Brown (Kew Bull. 323 (1907)) the generic name Pergularia really belongs to *Damia* and (This.-Dyer Fl. Cap. IV. i. 775) the species described under *Pergularia* must be renamed under *TELOSMA*, Coville.”

P. 554, line 19, omit “MALACCA: Griffith 3764.”

P. 574, l. 12, after “rounded” insert “or cuneate”

P. 579, lines 6 to 10, for “Wall. Cat. t. 4545” read “Lindl. Bot. Reg. (1847) t. 54; Hook. Bot. Mag. t. 4545; Wall. Cat. 8171; Dene. in DC. Prodr. VIII. 633; Miq. Fl. Ind. Bat. II. 513.”

P. 586, after line 7, insert note:—

“For a discussion of the curious modifications of the leaves of *D. Rafflesiana*, *D. complex*, and other species, see the following: Treub in Ann. Buit. III. 13; Scott & Sargent in Ann. Bot. VII. 243; This.-Dyer in Ann. Bot. XVI. 365; H. H. W. Pearson in Journ. Linn. Soc. XXXV. 376.”

PART No. 20 (1907).

Page 637, line 10 from below, for “T. Anders.” read “Wall.”

P. 641, l. 7, for “E” read “S”

P. 646, lines 12, 13, omit “*H. phlomoides*” and transfer “Miq. Fl. Ind. Bat. II. 779;” to after “DC. Prodr. XI. 90;”

P. 683, line 17, for “Wall.” read “Nees”

P. 700, last line of analysis, omit “18. CYMARIA” and insert

“Anthers 2-celled; upper lip of corolla merely notched	..	18. CYMARIA.
Anthers 1-celled; upper lip of corolla 2-lobed	.. ..	19. ACRYMIA.”

P. 701, line 4 from below, after “places” insert “PENANG: Deschamps. PROVINCE WELLESLEY: Ridley 7168. SELANGOR: at Kwala Lumpur, Ridley 10204. SINGAPORE: Hullett 63, 175.

ANDAMANS at Port Blair, *Kurz, King, Prain*. NICOBARS: Car Nicobar Moos, *King's Collectors*; Katchall, *Kurz*."

P. 702, l. 19, for "PERAK MALACCA" insert "PENANG: *Wallich* 2713 E; at Santong Sotong, *Curtis* 2492. DINDINGS: at Pangkore (marked ? introduced) *Scortechini* 1017. ANDAMANS: S. Andaman, *King*."

P. 702, lines 27 and 30, for "*graveolens*" read "*suaveolens*"

P. 704, line 4, for "PERAK: *Kunstler*" insert "KEDAH: Langkawi, on the small islands, *Curtis* 2577. PERAK: near Bernani River at 300 to 400 ft., *Kunstler* 8813."

P. 705, l. 10 from below, at end, insert "SINGAPORE: *Kunstler* 89."

P. 707, after "Provinces." insert "PENANG: *King, Deschamps*. PERAK: at Jenah, 200 to 300 ft., *Wray* 1759. MALACCA: *Griffith* 3957. SINGAPORE: *Wallich* 2733; *Schomburgk*."

P. 708, lines 19 and 20, for "SINGAPORE 7603!" read "PERAK: Upper Perak, *Wray* 4046; Rawang, *Ridley* 7603. PAHANG: Tahad River, *Ridley* 2131! MALACCA: *Griffith* 3966! SINGAPORE: *G. Thomson*; Bukit Panjang, *Ridley* 3951; Gunong Bintang, *Kunstler* 255"; and at line 22, after "cultivation," add "Sumatra (in Eastern Sumatra, *T. Daud-Herb. Ridley* 11336; at Kitta Djawar in open and sunny waste places in Lampongs, *Forbes* 1416A)."

P. 709, line 9, after "*Wray*" insert "1682."

P. 710, l. 28, for "In all the provinces" read "KEDAH: Langkawi *Curtis*. PENANG: Balick Polo Road, *Curtis* 868; *Deschamps*. PERAK: *Scortechini*. PAHANG: Katapong, *Ridley* 1286. MALACCA: *Hervey*; *Griffith*. JOHORE: Kwala Kanary, *Lake & Kelsall* 4028. SINGAPORE: *Kunstler* 128; *Hullett* 19; *T. Anderson* 148. NICOBARS: Kamorta, *Kurz*; Car Nicobar, *King's Collectors*."

P. 710, after line 28, at end of *DYSOPHYLLA* insert the following:—

2. *DYSOPHYLLA VERTICILLATA*, Benth. in Wall. Cat. 1544 (1828). An annual herb. *Stems* laxly branched, rarely simple, 6 in. to 3 ft. high, glabrous or nearly so. *Leaves* in whorls of 4–10, glabrous, linear, subacute, margin entire or obscurely toothed; 1–3 in. long, .15 to .25 in. wide; petiole short or 0. *Flowers* in villous or tomentose cylindric terminal spikes, 1–2 in. long, .2 in. in diam.; whorls of cymes close-set throughout. *Calyx* in fruit .08 in. long, campanulate; teeth subequal, triangular, stellately spreading. *Corolla* .08 in. long, pinkish; tube slender, hardly exerted; lobes pubescent. *Filaments* exerted, hairy. *Nutlets* ellipsoid. Benth. in Wall. Pl. As. Rar. I. 30, in Lab. Gen. & Sp. 159, and in DC. Prodr. XII. 157; Thw. Enum. Pl. Zeyl. 239 (in part); Hook. Fl. Br. Ind. IV. 639. *D. ramosissima*, Benth. in Wall.

Cat. 1543. *D. Benthamiana*, Hance in Ann. Sc. Nat. Ser. 5, V. 234. *Mentha stellata*, Lour. Fl. Cochinchin. 36. *M. verticillata*, Roxb. Hort. Beng. 44, and in Fl. Ind. III. 5. *Pogostemon verticillatus*, Miq. Fl. Ind. Bat. II. 965.

KEDAH: Langkawi, Coah, *Curtis* 2098! DISTRIB.—Throughout South Eastern Asia, and in Australia.

Page 714, line 15, for "PERAK: *Scortechini*" read "KEDAH: Kedah Peak, *Ridley* or *Curtis*. PERAK: Harans, *Scortechini* 788!"

P. 715, l. 6 from below, for "In all the provinces" read "SELANGOR: *Ridley* 7601. ANDAMANS: S. Andaman, *King's Collector*. NICOBARS: Nancowry, *King's Collector*."

P. 717, l. 26, after "escape" add "MALACCA: Bukit Bruang, *Hervey*."

P. 719, l. 10 from below, after "*Deschamps*!" add "; *Hullett* 9. PENANG: *Deschamps*. PROVINCE WELLESLEY: *G. King*. PERAK: *Thaipeng*, *Scortechini* 7, 482; *Telukanson*, *Ridley* 10769," and after "*Griffith*!" insert "ANDAMANS: S. Andaman, *King's Collector*."

P. 720, l. 23, after "1115!" insert "at *Tanjong Joking*, *Curtis* 2491; *Deschamps*. PROVINCE WELLESLEY: *Butterworth*, *G. King*. MALACCA: *G. King*"; and line 24, after "48!" insert "*Hullett* 9."

P. 721, l. 14, after "places" insert "SELANGOR: *Pudok*, *Goodenough* 10462. PAHANG: at *Pekan*, *Ridley* 1164."

P. 722, l. 17, after "7095!" insert "*Larut* at 500 to 1000 ft., *King's Collector* 2372."

P. 724, l. 18, after "*Wray*!" insert "*Goping*, *Kunstler* 467."

P. 725, l. 24, at beginning, insert "PAHANG: at *Pulau Tawar*, *Ridley* 2148, also at *Kwala Tanbeling*," and lines 26 to 31, omit "It has *Materials*" and add "*Ridley* has also collected in *Johore* at *Bukit Saga* (No. 11130) a plant, also with white flowers, which agrees with *G. oblongum* in every character except in having calyx-teeth much shorter than the tube."

P. 726, l. 3, after "1310!" insert "gathered in *Botanic Garden*, from a plant sent from *Waterloo*, *Perak*, *Curtis* 2166."

P. 727, after line 4, the end of LABIATÆ, insert the following:—

19. ACRYMIA, Prain in *Kew Bull.* for 1908, 114 (1908).

Undershrubs. *Flowers* small, in lax, many-flowered, peduncled, raceme-like, axillary cymes. *Calyx* erect, 10-nerved, the intermediate nerves weaker than the other 5, equally 5-toothed; the tube in fruit urceolate; throat within naked. *Corolla-tube* slightly enlarged upwards, shortly exserted; limb 2-lipped; lower lip 3-lobed, spreading, the mid-lobe larger than the lateral; upper lip suberect, 2-fid, not arched.

Stamens 4, exserted, didynamous, the upper pair shorter; anthers 1-celled. *Disk* small, equal, entire. *Style-arms* unequal, the upper very short. *Nutlets* obovoid, rugosely pitted; hilum very large, lateral.—**DISTRIB.** Species 1, endemic.

The genus *ACRYMIA* is closely allied to *Cymaria*, with which it agrees as regards inflorescence and fruit, but from which it differs in having a 2-lobed upper lip that does not conceal the 1-celled anthers. Though much smaller, the corolla of *Acrymia* resembles rather closely the corolla of *Ajuga*, a genus in which the anther-cells, though usually discrete, are sometimes at length confluent. In habit, however, *Acrymia* is unlike either of the genera to which it is so closely allied, and recalls that met with in an Indian group of species belonging to the genus *Gomphostemma*, which includes *G. ovatum*, Wall., and *G. Mastersii*, Benth.

ACRYMIA AJUGIFLORA, Prain in Kew Bull. 115 (1908). A dwarf undershrub. *Stems* woody, prostrate and rooting below, 2–3 in. long, densely leafy above. *Leaves* opposite, petioled, elliptic, obtuse, crenate except the sometimes unequally cuneate, or occasionally subtruncate base; dark green above, paler beneath, fulvous-strigose on both sides, especially along the 5–7 pairs of main nerves and the secondary reticulate veins; 4·5–8 in. long, 2–3·5 in. wide; petiole ·75–2 in. long, fulvous-strigose. *Cymes* dichotomously branching, with terminal flowers; flowers on the branches secundly arranged; main-peduncles strigose, slender, ·75–1·25 in. long; bracteoles subulate, shorter than pedicels. *Calyx* in flower campanulate, ·08 in. long, in fruit urceolate, ·15 in. long, strigose on the nerves externally; teeth 5, equal triangular as long as the portion of tube above the constriction; pedicels slender, strigose, ·07–1 in. long. *Corolla* white, ·25 in. long, glabrous; tube shortly exserted; lower lip spreading, 3-lobed, mid-lobe obovate; upper lip suberect, 2-lobed, lobes oblong, hardly exceeding lateral lobes of lower lip. *Filaments* exserted, hirsute at base, glabrous elsewhere; anthers 1-celled. *Nutlets* obovoid, ·02 in. long, wide-reticulate; at first sparsely pubescent, at length glabrescent.

PERAK: On limestone rocks, in dense jungle, 500–800 ft., *Kunstler* (*King's Collector*) 10709!

PART No. 21 (1908).

P. 795, l. 8, for "*SPHENODESMA*." insert "*SPHENODESME*."

NOTE.—Since the completion of the Families of the Gamopetalæ, a paper has been read before the Linnean Society by Mr. H. N. Ridley, F.R.S., on a "Collection of Plants made by Messrs. H. C. Robinson and L. Wray on Gunong Tahan, Pahang." It describes a number of new species, and should be consulted by all workers who may make use of the 'Materials for the Flora of the Malay Peninsula.' It was published in Linn. Soc. Journ. Bot. XXXVIII. 301 *et seq.* (1908).